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Martin Dewey, D.D.S., M.D., New York
Editor



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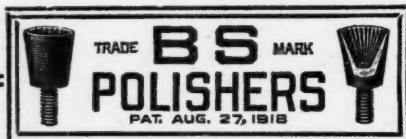


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The International Journal of Orthodontia and Oral Surgery

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VOL. VIII

ST. LOUIS, JANUARY, 1922

No. 1

ORIGINAL ARTICLES

A CONSIDERATION OF BITE-PLANES IN ORTHODONTIA*

BY V. H. JACKSON, M.A., M.D., D.D.S., F.A.C.D., NEW YORK, N. Y.

ON RECEIVING the invitation to meet with you today it occurred to me that as I was making a constant study of abnormal and normal dental arches, noting particularly the changes that take place in their development, especially the changes in the mandible, as force is applied for that purpose in equalizing the arches, etc., that it would be well to present and review with you, some of the various phases of the subject.

A great day is dawning in the science of orthodontia, and you, gentlemen, have chosen for your life work a great specialty not only of dentistry but a *specialty of medicine*. Our duty and responsibilities to humanity are exacting. The teeth are the mill that crushes, prepares and mixes the food with saliva, which is the first step in the process of digestion and any improvement in the occlusion of the teeth that can be brought about by our orthodontic treatment for that purpose would be of inestimable value to the patient.

The teeth are distinct in their importance in all plans of animal nutrition.

Again, orthodontic treatment is necessary as it is professionally acknowledged that between thirty and forty per cent of children suffer in some degree with nasal stenosis from some cause, as from hereditary lack of development of the organs; or, it may be from a general systemic, or acquired condition. The swelling of some of the glands, in "Waldeyer's Ring," or of the lymphatic tissue, clogs the nasal aperture, thus diminishing the breathing capacity, which instinctively brings the muscles into action for the purpose of improving the breathing capacity, but the congestion most generally further persists, gradually causing the habit of mouth breathing. Through this the maxillary and mandibular arches are separated. Their further separation in

*Read at the Meeting of the Alumni Society of the Dewey School of Orthodontia, Atlantic City, April 25-26, 1921.

mouth breathing puts other muscles on the stretch, which through their natural tonicity usually cause the maxillary arch to become narrowed and assume what is known as a V-shaped arch and, from this same influence the mandibular arch also is narrowed, often resting in posterior occlusion, with the incisors antagonizing with the gum back of the maxillary incisors.

The laryngologist and rhinologist specializing in the treatment of faucial and nasal conditions, which require the increase of space for free nasal breathing, are often led to surgically remove some of the tissues that should remain, if it be possible to keep the particular tissue in normal health without the operation. Many of these forms of treatment have proved unsuccessful in the long run.

The presence of adenoid tissue is normal, but when it becomes inflamed and swollen, as from the forced restriction of air currents in breathing, it clogs the nasal or pharyngeal space and interferes with respiration. The congestion of these tissues, as with other body tissue, results from the initial irritation, which in such cases is generally caused, it is thought, by the strained force of the air through the restricted areas of the air passages.

Generally Nature is helpless in improving these conditions and there seems to be no hope that through natural advancing development of the air channels the space will become sufficient. The orthodontist through his experience recommends early treatment and often increases the nasal space by orthopedic movement of some of the bony framework. The early treatment for this special purpose is essential, as one should operate while the bone is in its most developmental stage and before the dome of the arch encroaches too much upon the nasal space.

The roof of the mouth is the floor of the nose. The practical method of increasing nasal space to bring about a permanent normal condition of the framework and soft tissues of the maxillary and nasal region is to expand laterally the maxillary arch early in life while these bones are in their most developmental and receptive stage. With this knowledge it is intended that the orthodontist, through treatment, should assist Nature in increasing the nasal space when necessary and at the same time improve the occlusion of the teeth, as by the early lateral expansion of the dental arches. In fact, it is Nature's plan that, by the time the child is twelve years of age, his maxillary arch in front of and including the second permanent molars should be established and be as broad as this part of the adult arch is intended to be.

In conveying these ideas to the parents, as is our duty, we should speak of the *permanent teeth* as *adult* teeth and it is even more impressive to the parent when speaking of the child's permanent teeth, that we speak of them as a man's or a woman's teeth, located in the child's dental arch.

We should impress it upon the mind of the parent that the permanent teeth when erupted are as large as they ever will be and that it is Nature's intention that the arch should be broad enough to properly accommodate the permanent teeth in good line at the early age when the teeth are erupting, in fact, at this time establishing an adult arch in a child's mouth. In a large percentage of cases, through heredity, constitutional conditions, or the ordi-

nary habits of life or environment, the dental arches do not naturally become broad enough or develop sufficiently in their lateral or anterior dimensions to normally accommodate the permanent teeth without orthodontic assistance.

In a certain number of cases the mandible may be prognathus, with the incisors resting in front of the maxillary teeth, in some instances even antagonizing with the gum, causing irritation or congestion. On the other hand, in a large percentage of cases of disturbed breathing, the patient has a receding mandible. The occlusion of the teeth accompanying either of these conditions is imperfect and permanently detrimental as first by the mandibular incisors resting in front of the maxillary incisors or, second the incisors occluding too far back of them, with the resulting expression of a too prominent or a receding mandible. With either of these conditions the facial line is imperfect and significant of these deformities.

In cases of posterior occlusion of the mandibular arch, the incisor teeth and canines with their sockets usually rest higher than normal in the occlusal plane and often antagonize more or less with the gum back of the maxillary incisors, the mandible not being well developed. The mandibular incisors,

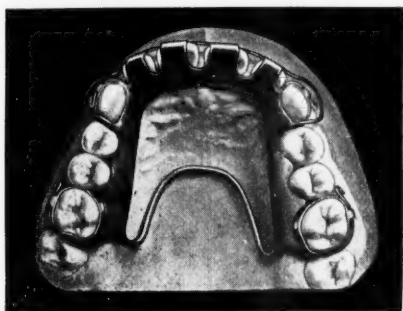


Fig. 1.

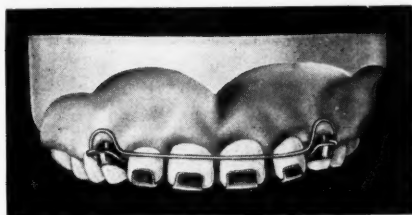


Fig. 2.

however, may antagonize with the gum back of the maxillary incisors even when there is normal occlusion of the lateral divisions of the arches.

The plan of procedure for the correction of either of these conditions and for relieving the excessive lap in case of overbite generally requires the depression of both the maxillary and mandibular incisors in some manner and the equalization of the arches. An appliance for these purposes is constructed with a flat lingual shelf attached to the arms of a regulating appliance. The appliance is usually anchored to the molars and to the canines, the shelf-like palatal projection being close back of the maxillary incisors and so shaped that all the occlusal force of the mandibular incisors and canines rests upon the shelf in occlusion, causing an open bite and preventing all other maxillary and mandibular teeth from occluding.

Fig. 1 illustrates such an appliance fitted to a maxillary arch. When necessary to depress all of the incisors or individual incisors to the front edge of the lingual shelf is attached back of each of the incisors to be depressed, a thin strip of 28-gauge plate metal usually three to four millimeters wide. Each projecting strip of metal is fitted to the lingual surface of the incisor, and shaped to pass over the incisive edge in the form of a hook and to lap in

front of the incisor as shown in Fig. 2. To each tooth requiring further depression, additional force is caused by curving more the end of the metal.

The labial semicircular spring shown in this case is not especially essential when the plate metal hooks are adjusted to each of the teeth to be depressed.

Fig. 3 illustrates a profile view of the case with posterior occlusion before treatment, requiring the depression of the incisors and equalization of the dental arches.

Fig. 4 is a front view of the case before treatment.

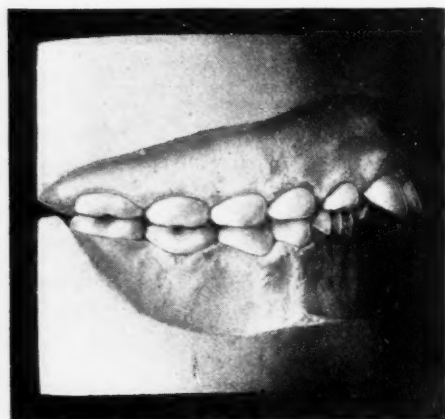


Fig. 3.

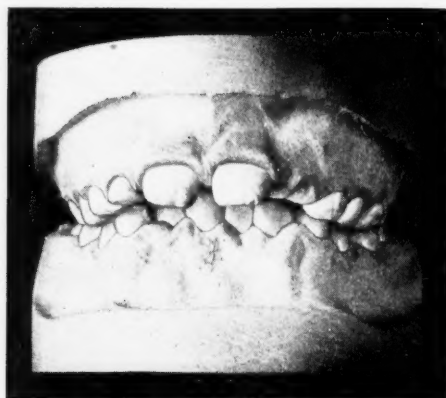


Fig. 4.

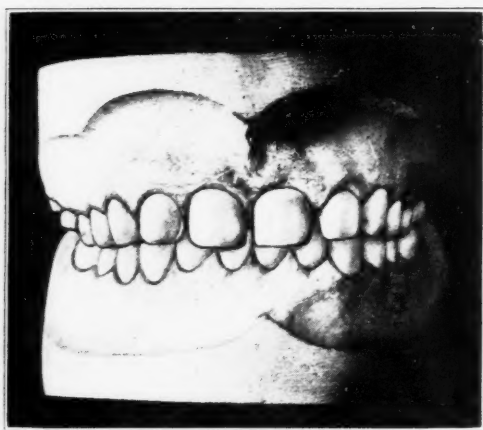


Fig. 5.

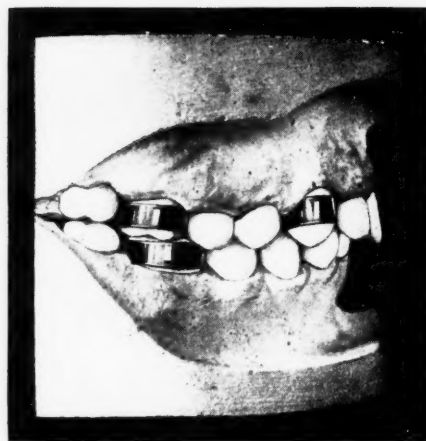


Fig. 6.

Fig. 5 shows a front view of the case after treatment with a lingual shelf and equalization of the arches.

In Fig. 6 is seen a profile view of the case after correction with anchorage collars in place.

Fig. 7 illustrates a similar appliance with a *lingual-shelf* anchored with wire clasps. The shelf is sustained to resist the occlusal force by a small looped wire shaped to pass around the tapered point of each of the upper canines and resting near their mesial and distal surfaces, with the ends of the wires extending toward the gum and passing underneath the shelf, to which

they are soldered. This metal support on the canines resists the force in mastication without depressing the maxillary incisors. When the maxillary incisors need depressing with this form of appliance, the labial semicircular spring as described is employed. This has a loop opposite each canine with the ends of the spring passing over the arch at the junction of the canine and first premolar to be united to the appliance. The action of the spring arranged in this manner would force the incisors against the appliance, the teeth being wedge shaped, the force would cause them to become depressed with their sockets and, at the same time, the mandibular teeth would become depressed by the occlusal force on the shelf. The shelf can be either level or inclined according to the requirements.

Fig. 8 illustrates a plan of depressing maxillary and mandibular extrud-

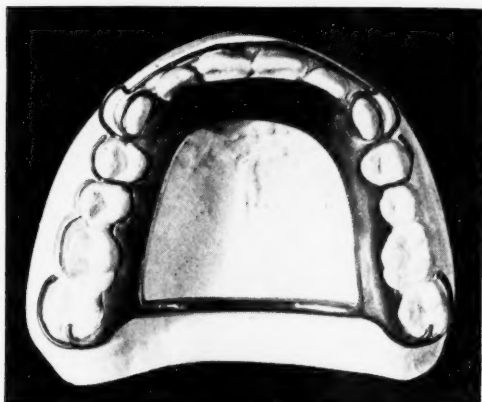


Fig. 7.

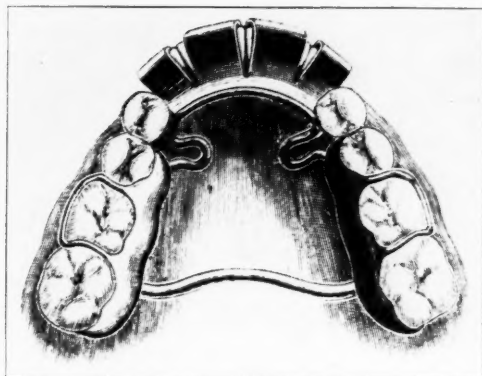


Fig. 8.

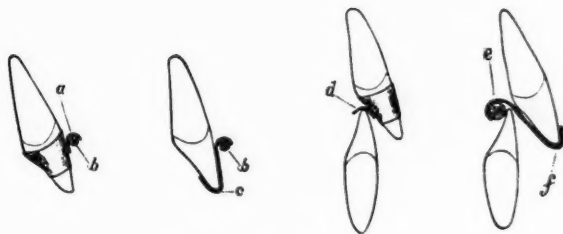


Fig. 9.

ing incisors when canines or first premolars are absent. Narrow strips of plate metal 28-gauge as described, are made hook-shaped to pass over the incisors from the lingual to the labial side and to be attached by solder to a medium sized spring wire shaped to follow the lingual curve of the arch and formed into U-shaped loops, one on either side pointing toward the median line with the free ends of the spring soldered to the lateral arms of the appliance.

With this plan it is intended that the extruding mandibular incisors should occlude in front of the lingual spring. (This is more thoroughly described in the following figure, *c*. If for any purpose more space is required, as for an erupting tooth between the premolars and incisors, the lingual loop of the appliance should be opened a little from time to time for forcing the incisors forward, thus causing space for that purpose and, at the same time depress-

ing the teeth by curving the metal a little more at a time over the incisive edge of the incisors.

In Fig. 9, *c, f*, it will be seen that shortening the metal by bending the curved end of the hook passing over the incisive edge of the incisor, *f*, that occlusal force would cause it to rest heavier and gradually to force the incisor with its socket more deeply in the process, the changes for that purpose being made once a week or at longer intervals. The figure illustrates several other forms of apparatus for depressing both maxillary and mandibular incisors, *d* shows a collar with a lingual curved shelf cemented to a maxillary incisor, located to cause depression of the mandibular incisors in occlusion.

A plan utilized for depressing maxillary incisors shown in the next drawing is by attaching to a well-anchored maxillary appliance a labial semicircular spring *B*, with U-shaped loops located opposite the canines. For causing force an S-shaped strip of plate metal is hooked over the spring and over the incisor, *c*. The spring is adjusted as required for causing force. In place of this plan, a collar with a labial hook, when desired, can be cemented to a maxillary incisor for supporting a labial spring as shown, *ab*.

It should be understood from most all the previous descriptions that the

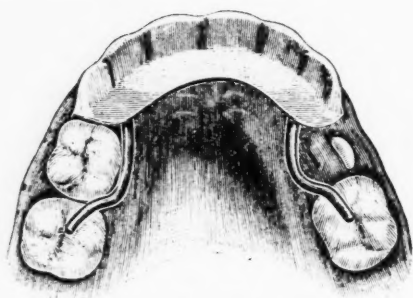


Fig. 10.

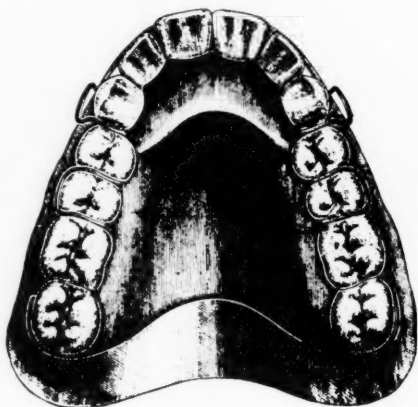


Fig. 11.

occlusal force described for causing the depression of the incisors is intermittent, as the teeth of the maxillary and mandibular arches are not in occlusion when at rest, but occlude only when one is masticating, swallowing, or when the body is under special muscular strain. Of course the intermittent force in occlusion would not cause the depression of the teeth as effectively as would be if the force were continuous.

Fig. 10 shows a plan of an appliance employed for depressing the maxillary and mandibular incisors by occlusal force and, at the same time moving the maxillary incisors inward bodily by a metal cap swaged to cover the incisors and to be cemented to them. A thick metal shelf is shaped and soldered to the lingual surface of the cap, with the shelf tipping downward and backward and two wire supports extending backward from the upper side of the shelf with the free ends resting on a molar, one on each side of the arch.

To the front part of the cap is soldered a suitable socket for the attachment of a cross bar used in connection with a cranial cap for causing force

for the movement of the teeth inward. It will be noted that with this arrangement the palatine bars extending backward and resting on the molars hold the front teeth upright and prevent them from tipping inward as force is applied for their movement.

For these purposes, only all metal planes are now employed, but Fig. 11 illustrates the plan of a maxillary vulcanite rubber bite-plane that was used by the author many years. This one is anchored with wire clasps and spring clasps, having a labial semicircular spring with U-shaped loops opposite the canines. The object of the spring is to force the maxillary incisors against the plane when it is desired to depress them, while the mandibular incisors are being depressed through their occlusion on the plane. The plane is sometimes considerably thickened and extends downward and backward.

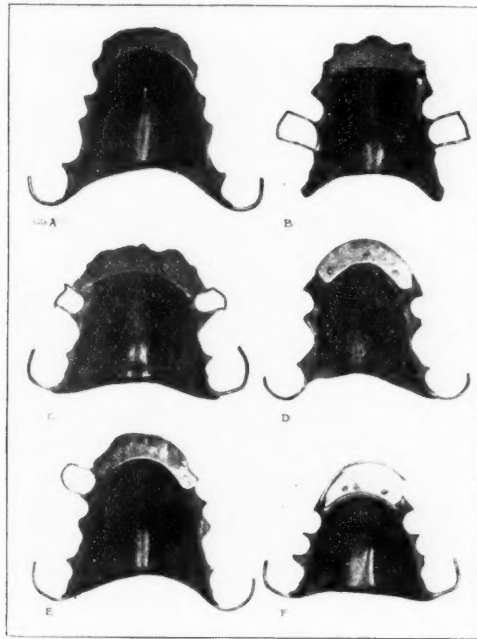


Fig. 12.

In cases of distal occlusion with the mandibular incisors and canines antagonizing with the gum back of the maxillary incisors, with all of the occlusal force being exerted on the inclined plane by these particular teeth, the tendency is to depress and cause them to slide forward on the incline, but sometimes, with this plan the teeth *wear the rubber away* causing pits which interfere with the teeth moving forward as desired.

Fig. 12 shows several forms of vulcanite bite-planes *now out of use* that were retained in a similar manner as with wire clasps and spring clasps, or by suction. To prevent the wear of the vulcanite by the teeth in occlusion pieces of plate metal covering the inclined plane or shelf were riveted to the plane as shown.

When there is sufficient incline of the distal part of a plane the force in the occlusion of the mandibular incisors and canines on the plane would force them to slide and pull forward on the mandible and in certain cases would

cause what has been termed "*Jumping of the bite.*" This force when persisted in with some cases gradually causes a change in the angle of the mandible, permitting that result. This principle will be further elaborated as we proceed.

Fig. 13 also illustrates a plan that has been employed for that purpose. A vulcanite plate anchored to the maxillary arch with wire clasps and spring-clasp attachments, has a metal incline extending laterally from the appliance, one resting on a distal molar on each side of the arch, the planes being steep and so arranged as to project considerably downward and pass just back of the last molars of the mandibular arch to prevent it from taking posterior occlusion.

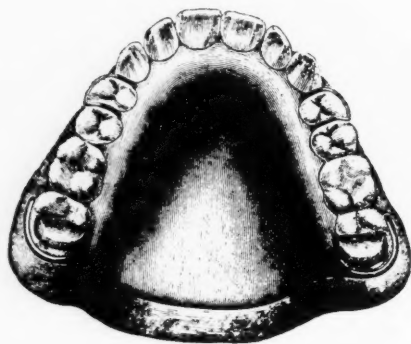


Fig. 13.

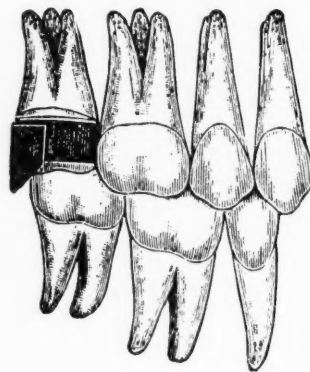


Fig. 14.

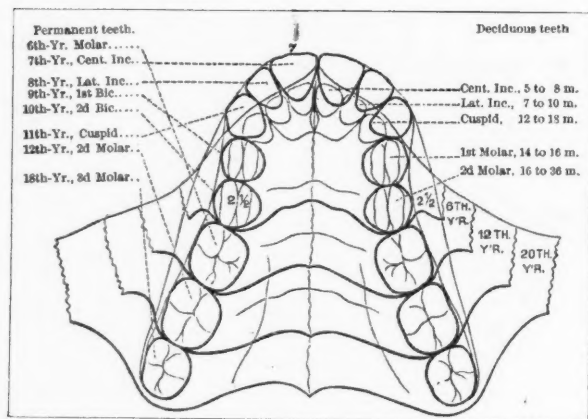


Fig. 15.—A drawing to illustrate the progressive normal development of the upper maxilla and that of the saddle and V-shaped arch, the time, and order of the eruption of the deciduous and permanent teeth, etc.

Fig. 14 shows a metal incline that has similar features to the one described for preventing posterior occlusion of the mandibular arch. A collar having a steep metal incline is cemented to each of the last maxillary molars of the arch; it is sometimes attached to two molars on each side, the incline passing back of the last mandibular molar when in occlusion.

In the study of the development of the maxillary and mandibular arches it is instructive to note the various changes that take place through their development. We will make a hasty reference to some of the characteristic changes in each, that are most important to the orthodontist.

Fig. 15 is a diagram outlining the different recognized stages of development of normal and abnormal maxillary arches. It is intended to indicate the progressive anterior development of the maxillary arch. In each stage the arch develops forward sufficiently for the successive eruption of each of the deciduous molar teeth of the child and is followed by the time of the full development of each of the permanent or adult teeth in their regular order of eruption, as the 6th, 12th, and 20th years. All of these changes in the anterior and lateral development of the maxillary arch take place in front of the palatal bone and just in front of the pterygoid processes of the sphenoid bone.

These processes are fixed points anterior to which all development of the maxillæ takes place. These processes of the sphenoid, through lateral development, influence or govern the successive widening of the maxillary arch through each successive stage of its anterior development as indicated.

The maxillary arch is firmly *supported by the skull*, while the mandibular arch is *suspended from the skull* by ligaments and muscles.

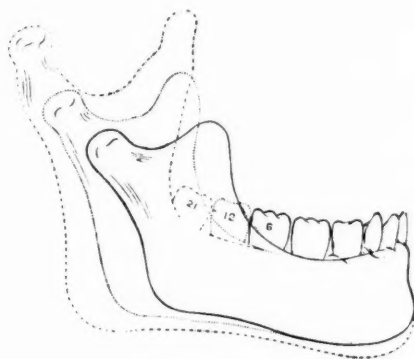


Fig. 16.

The description given in Fig. 16 of the maxillary arch illustrates Nature's remarkable plan of development of the dental arches and the erupting teeth, and singularly, the teeth in each of the maxillary and the mandibular arches appear in similar successive stages of eruption. Those of the mandibular arch appear in the same order and intervals, and usually a little before the time of the eruption of the teeth of the maxillary arch.

The illustrations picture the variations relative to the developmental correlation of each of the dental arches and teeth. Each half of the mandible is divided into an ascending *ramus*, and a *body*, joined at the angle. All through the stages of the progressive development of the mandible, the head of the ramus rests normally in the temporomandibular articulation. At the same time the ramus and body of the mandible are steadily developing in all of their proportions. The body is developing forward from the ramus and finally contains and supports all of the developing teeth in their different stages dating from infancy to adult life. It will be noted that each succeeding tooth erupts in the body of the mandible just in front of the ascending ramus.

A similar plan is followed through the eruption of the teeth of the maxillary arch, always in front of the fixed points of the pterygoid processes as described.

The body is steadily developing forward from the ramus and lengthens in front of the ramus in each stage sufficiently for the normal eruption of each successive developing deciduous tooth and the succeeding permanent molars, as first the eruption of the deciduous molars, then the 1st, 2nd and 3rd permanent molars are erupted in their regular order, as in the 6th, 12th and 20th years. As stated, during all of this period the head of the ramus is resting in its temporomandibular articulation, and is progressively lengthening from above downward, increasing the length of the features, and at the same time the anteroposterior measurement and all other measurements of the body of the mandible and of the ramus are increasing in proportion to the other bones of the skull. The figure also shows the progressive development from the obtuse angle of the mandible of the child to that of the adult. This interstitial developmental condition at the angle permits a ready change to a more or less obtuse angle as desired.

Fig. 17 illustrates a model of a mandible arranged to demonstrate the changes that take place in the mandible from the application of intermaxillary force in equalizing the dental arches anteroposteriorly, as by the use

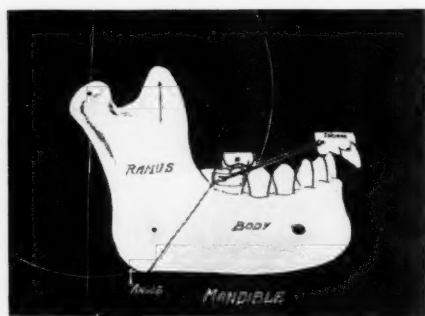


Fig. 17.

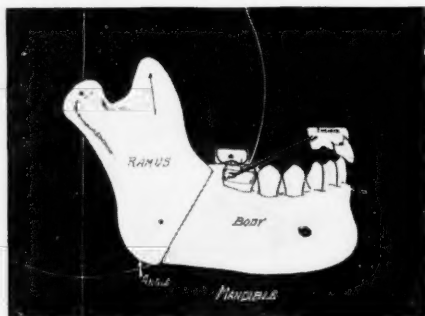


Fig. 18.

of rubber equalizing bands. An equalizing band is shown in the figure extending from the canine of the maxillary arch to the first mandibular molar for that purpose. It will be noted that the case is one of posterior occlusion with the mandibular incisors antagonizing with the gum far back of the maxillary incisors. This and the following figures are to demonstrate that the change in equalizing the dental arches from posterior occlusion to normal does not establish a new temporomandibular articulation, but that it *bends* the *mandible* at the angle, which results in causing a more obtuse position of the ramus in its relationship to the body of the mandible. This bending of the mandible for the correction of the occlusion is brought about by moderate constant force of the equalizing bands following the *laws of force*—"as a slight constant force will cause the softening of the bone, while an interrupted force, as first pressure and then relief, causes the strengthening and development of any bone." Many years ago, this principle was established by the author.

It will be noted that the first maxillary molar and the maxillary central incisor represent the maxillary arch, with the mandibular incisors antagonizing with the gum back of the maxillary incisor. The very difficult problem

that we were discussing, represented with the bite-planes, showed that as occlusal force was applied it brought about depression of the incisors, and that with the proper incline of an occlusal plane the mandibular arch in certain cases would be forced forward to a normal occlusion through the changes at the angle of the mandible. In all of these cases as the ramus becomes more obtuse the body of the mandible takes an advanced position or becomes more prominent in its relation to the maxillary arch. This, as we have determined, is occasionally accomplished by the use of a bite-plane, but the logical method of bending downward the front part of the body of the mandible is through the process of equalizing the dental arches as shown. The forward traction on the molars acts on the lower end of the ramus while, at the same time, the *sustaining muscles* are put on the stretch in holding the condyle of the mandible in its proper position. Through these two constant forces the angle of the mandible is gradually caused to become more obtuse, which permits the teeth of the body of the mandible to rest in normal occlusion both with the molars and the incisors.

From this constant traction by the intermaxillary force the ramus is

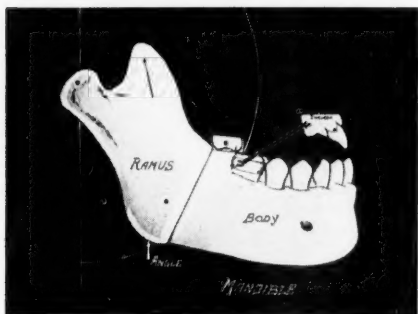


Fig. 19.

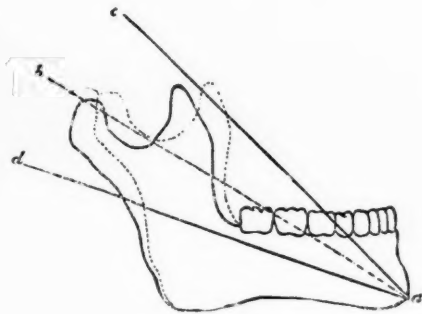


Fig. 20.

made more obtuse with the body tipped downward (Fig. 18), and it will be noted that as the body is drawn further forward with the maxillary and mandibular teeth in occlusion it cannot go to a higher level, but with the changes in the mandible the lower end of the ramus has reached a higher level and the front part of the body, with the teeth, are resting more prominently and in normal occlusion. These latter changes are what we usually seek for in the process of equalizing the dental arches.

If the same equalizing force should injudiciously be continued too long and the angle of the ramus become abnormally obtuse, as has been known to occur, the body of the mandible would become still more prominent and, by this added change of the angle, it would cause a *prognathus condition*, which might be accompanied with lack of incisal occlusion of the teeth (Fig. 19). This condition is not infrequently brought about by the *overuse* of the intermaxillary force in equalizing the arches. When this prognathus condition exists with abnormal occlusion of the teeth it is treated for correction by reversing the intermaxillary force, that is, adjusting and stretching an equalizing band from the mandibular canine to the last maxillary molar, but in true prognathism, additional force with a chin cap and cranial cap should also be employed.

Fig. 20 illustrates the principle for the reduction of a prognathus mandible through the bending of the mandible at the angle. Intermaxillary force by the equalizing band should be applied as described and at the same time, in addition, a chin cap and a cranial cap should be employed. There are other phases of this subject that would be interesting to present.

In Fig. 21 is shown a plan of a lower device that has been used for sustaining the mandible in its new position after being reduced from a prognathus condition. The appliance has two ascending planes, one on either side of the arch, projecting upward from the crown of each of the last erupting molars, passing back of the last maxillary molars for retaining the teeth and mandible.

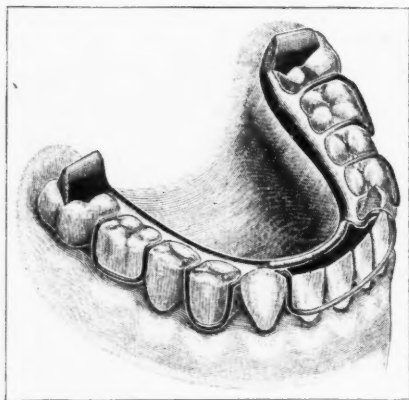


Fig. 21.

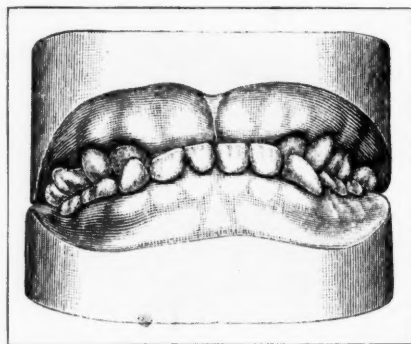


Fig. 22.

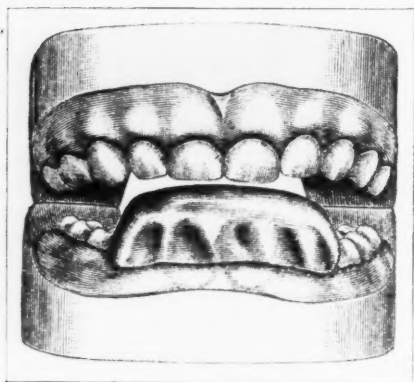


Fig. 23.

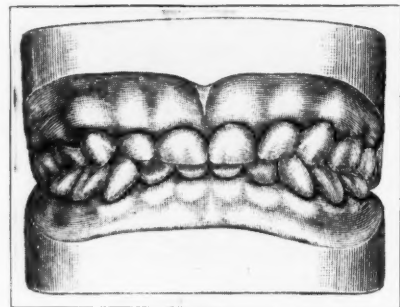


Fig. 24.

The orthodontist is utilizing to advantage the principle of the inclined plane for the depression and elevation of the teeth, the moving of the teeth to new positions, etc.

In Fig. 22 is shown the teeth of a child aged two years and ten months, with an extreme prognathus condition, the mandibular incisors resting on the gum in front of the maxillary incisors.

The case was corrected by cementing to the mandibular incisors and canines a metal cap (Fig. 23) with an incline pointing upward and backward so that in occlusion it would press against the maxillary incisors and force the mandibular arch backward. This brought about a good result in a limited time as shown in Fig. 24.

Fig. 25 illustrates a plan for moving outward through occlusal force one or more maxillary incisors that rest in a lingual position by the use of an inclined plane. The appliance has a lingual base wire anchored to one or more of the molars on each side of the arch and to the base wire is soldered plate metal bent in the form of an inclined plane passing over the incisors.

It is especially pleasing to me on this occasion to have before us the "Consideration of Bite Planes in Orthodontia." To improve these conditions several early, thoughtful operators recognizing the necessity of improving the occlusion of the teeth, utilized and described a bite-plane for depressing the mandibular incisors with their sockets; it being especially referred to by Drs. Colignon and Barret of Paris, and by Dr. Kingsley of New York. Each of these men in comparing notes described the advantages of the maxillary plate known as a bite-plane, and Dr. Norman Kingsley, in his "Orthodontia, 1888," described and used for the purpose of depressing the incisors a rubber plate with a shelf on which the mandibular incisors would rest in occlusion. The bite-plane, as described, was worn continually for this purpose. From its use it was found, in some instances, that it not only depressed the incisors, but that the mandibular arch was moved slightly forward with a tendency toward a better occlusion of the teeth.

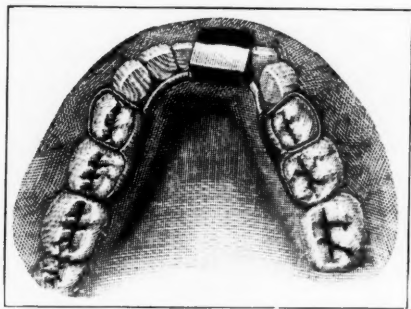


Fig. 25.

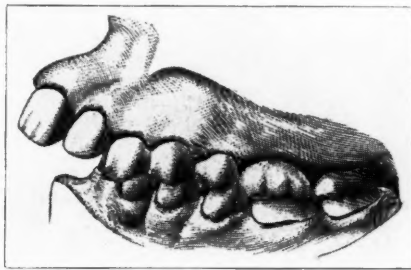


Fig. 26.

Later it was determined that if the shelf should be tipped downward and backward so that, in occlusion, the mandibular teeth would slide forward on the incline, it would draw forward on the mandibular arch in that manner, tending to still further depress the incisors and at the same time the use of the bite-plane brought about the "jumping of the bite" as Dr. Kingsley stated regarding his case.

In February, 1887, at the Academy of Medicine* in New York, at a meeting of the New York Odontological Society, Dr. E. A. Bogue, then President of the Society, presented models and described a regulating case that he saw while under treatment by Dr. Jules Colignon of Paris. It was a case having protrusion of the maxillary incisors and posterior occlusion of the mandibular arch with the incisors antagonizing with the gum back of the maxillary incisors. Dr. Bogue remarked that this case is one of the class that we read about but of which he had sought a practical illustration without success. He then read a short description of the case that Dr. Colignon had presented to him with his models, in which he stated that he was impressed with the idea that

*Cosmos, 1887, pages 318-325.

it was possible to drive the teeth into their alveolus or cause them to elongate, and accordingly, in April, 1886, he inserted a rubber plate covering the palatine vault, allowing only the mandibular incisors to rest on a ridge on the plate in occlusion.

The following figures were used to illustrate the case:*

Fig. 26 illustrates the maxillary protrusion and mandibular posterior occlusion.

Fig. 27 shows the V-shaped maxillary arch.

Fig. 28 illustrates the outlines of the maxillary arch improved by lateral expansion.

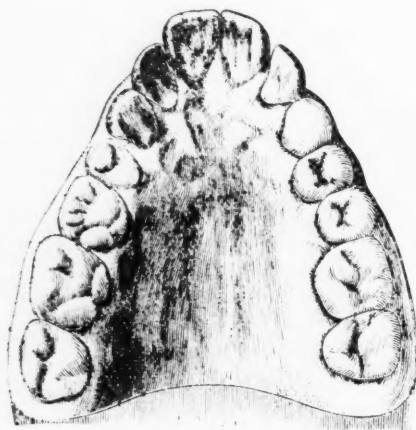


Fig. 27.

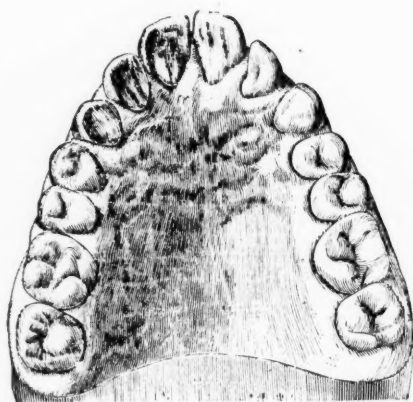


Fig. 28.

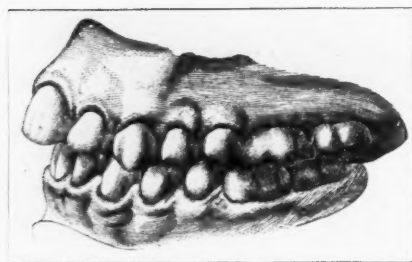


Fig. 29.

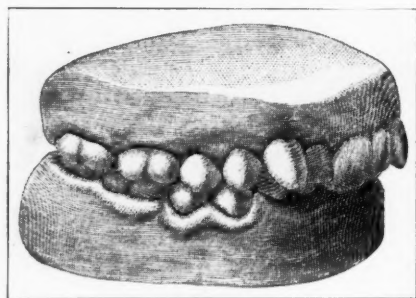


Fig. 30.

Fig. 29 shows the improved occlusion of the teeth after the jumping of the bite, leaving the teeth practically in normal occlusion.

Dr. Colignon in his letter stated that he had searched in vain to find what *jumping the bite* meant, although he had already accomplished it and the result was exceedingly gratifying. Dr. E. A. Bogue thought that the irregularity was probably caused by thumb sucking. After reading the paper, Dr. Bogue asked the members for suggestions as to how the changes were brought about and stated that the lateral expansion between the canines was caused by the use of a rubber plate, which was split from the front a little beyond the middle and separated by screws, expanding the arch about one centimeter. The plate was retained by bands on the canines.

*Cosmos, 1887, pages 318-325.

At a later meeting of the Academy, (*Cosmos*, 1887, page 477,) Dr. Bogue, President of the Society, presented models of an orthodontic case with posterior occlusion, with a letter from Dr. W. H. Barrett of Paris, showing how Dr. Barrett corrected the case by the use of a bite-plane with which he claimed to have "jumped-the-bite."

At the time there was much discussion as to what had taken place to permit this. It would be interesting if Dr. Bogue, who is present, would tell us more of his views at that time, regarding these changes.

Fig. 30, before correction of distal occlusion.*

Fig. 31, palatal rubber plate with inclined shelf.

Fig. 32, corrected case.

This, the present day knowledge and success in equalizing the arches, has been brought about through the steady search and better understanding of the principles in connection with the changes and bending of the mandible.

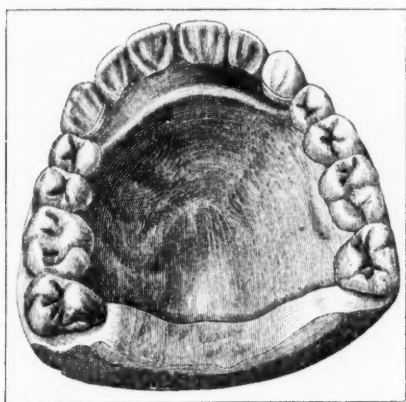


Fig. 31.

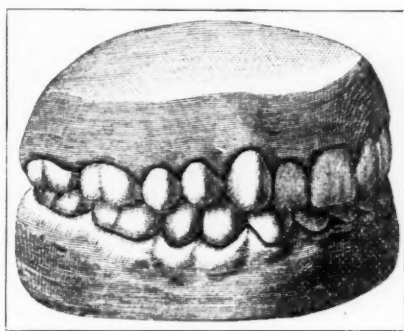


Fig. 32.

DISCUSSION

Dr. Martin Dewey, New York City.—Mr. President and Members of the Alumni Society of the Dewey School of Orthodontia: The request came to me from several sources that we have a paper presented before this Society on "Bite Planes in Orthodontia." The bite plane is one of the orthodontic appliances I have never used. However, I know Dr. Jackson has used a great many of them; that they fit with certain principles in his system of technical construction, and consequently after using considerable influence he consented to present this paper before our Society. Both Dr. Eby and I took Dr. Jackson aside and gave him some idea of what we thought the members wanted, and his paper to-day is an example of what Dr. Jackson understood was wanted about bite planes.

He has covered the subject from his years of experience much better than any one else could do who has been selected to discuss his paper. He has covered the subject much better than any man in this Society could do or any man who has had but 15 or 20 years of experience. If you go back and see the results of cases taken in plaster in 1887, which Dr. Jackson obtained in his own practice, it makes those of us who have been in practice ten or more years feel as if the practice of orthodontia is simply a process of evolution. Each one of us has had to contend with the same problems that the older men have solved. That to a certain extent is the history of education of every individual. The evolution of education of any one in the profession is simply the fact that we have traveled over the same ground that has been traveled over for years by those who preceded us. While it is true we can travel over the same ground more rapidly, nevertheless this paper has impressed

**Cosmos*, 1887, p. 477.

us with the fact that a lot of things discovered and presented as new are known to have been old things.

You may remember that a few years ago a certain gentleman received much notoriety by presenting a paper before five or six different societies. A great many individuals believed at that time that the ideas advanced in that paper were new. Dr. Waldron in the discussion of one of those papers presented one of the illustrations which Dr. Jackson presented here today. Dr. Waldron said the principle was used years ago by Dr. Jackson, and these facts are correct in regard to bite planes. One illustration of the condition he showed today was first described by Dr. Brady, of Kansas City, Missouri, when he and I worked together in 1910. I thought it was original with him, and the first time I heard about it was Dr. Brady's description to me, and a similar illustration appeared in my first textbook. Dr. Jackson showed it years before that time, which proves that some of the problems we are struggling with today are problems that the older men struggled with and settled to their satisfaction. Dealing mostly with changes which occur in the mandible in regard to the treatment of posterior occlusion cases, the older men have not settled them to their own satisfaction. This is proved by the fact that practically the entire program of the American Society of Orthodontists in the following days of this week is to be devoted to posterior occlusion cases. Some of the problems we are to take up before that meeting I have no doubt will be some of the things that Dr. Bogue and Dr. Jackson discussed in 1887. Those fellows in 1887 arrived at the same conclusions that will be arrived at the latter part of this week, which is another example that education moves by stages of progress, and the younger individual has to travel over the path of the older. For some reason, somehow, I do not know why, I have for a number of years held to the idea and advocated, as a great many of you well know, the changes which occur in the mandible in the treatment of posterior occlusion, are the same changes Dr. Jackson has analyzed today: namely, in treating posterior occlusion changes occur in the body of the mandible, and not in the temporomandibular articulation. There is some question as to whether a case of posterior occlusion has been permanent where changes occur in the temporomandibular articulation. We have evidence that posterior occlusion will change the temporomandibular articulation, but no evidence as to the permanent maintenance of this changed position of the condyle in the treatment of posterior occlusions, and the disto-relation of the case.

The diagrammatic illustrations which Dr. Jackson shows with his model of the mandible prompt us to ask, has he changed the body of the mandible and produced a bending in the body of the mandible? As he says, the mandibular appliance with a plane in posterior occlusion, with no overbite, eventually produces some change in the body of the mandible if the result is going to be permanent. A great many practitioners are carrying us back to the treatment of posterior occlusion cases by banding the teeth, bringing about a change in the temporomandibular articulation, which results in a lot of failures. Furthermore, that the change which takes place in the body of the mandible may be permanent is well illustrated by the paper Dr. Case presented before the American Society of Orthodontists last year under the title of "Principles of Retention."

Dr. Case had convinced himself from long experience that the forward movement of the mandible in the temporomandibular articulation was a failure. A change must occur in the body of the mandible. While he did not arrive at the same explanation as Dr. Jackson, still he accomplished the thing in another way by lengthening the dental arch by carrying the anterior teeth forward sufficiently far to lengthen the mandibular arch so as to put in an artificial substitute and make a mandible with three premolars. He has worked on the idea along another line to keep the condyle where Nature put it and bring the body of the mandible forward. Whatever plan of treatment you follow, to get a permanent result in posterior occlusion, whether you use bite planes or intermaxillary rubbers, you will change the plane of occlusion and lengthen the body of the mandible. Dr. Jackson's description did not tally with the illustration he showed because I imagine the illustration had been taken from some other work. That was the illustration where various changes occurred in the mandible from the child up to adult age, where he started to change the mandible during deciduous dentition and before the first and second molars had been added. The

anterior portion of the mandible remained at the same point and the change which occurred appeared to be an upward and backward movement of the mandible which is an impossibility. The condyle, like the pterygoid plates, of the sphenoid bones he mentioned, are a fixed anatomical proposition. The change occurred in the mandible by downward and forward movement which carried the anterior teeth forward also, lengthening the ramus by downward growth, resulting in a condition you see in the adults who have normal occlusion.

I have been fortunate enough to find one skull in all the years I have been doing research work that showed a typical posterior occlusion, the teeth of which are present, indicating that the malocclusion has not been caused by mutilation, and the mandible is exactly the same shape as Dr. Jackson has described today. If you could take that mandible and bend it as he suggested, you could correct the posterior occlusion. In comparing that skull with all other skulls I have seen that have normal occlusion, the condyle occupied exactly the same anatomic relation.

I am deeply indebted to Dr. Jackson for showing the periods of evolutionary change in the treatment of posterior occlusions and the treatment of anterior occlusions and for disproving the old theory which a great many men have accepted. It again forcibly illustrates the fact that education is simply a progressive proposition, and that each individual has to travel over the same ground as the other men have traveled in order to gain experience.

Dr. J. W. Ford, Chicago, Ill.—I wish to pay my tribute to Dr. Jackson for his work. We are greatly indebted to him for bringing before us something which has not been previously presented. I think in the development of lingual planes or common dental planes we have to go back originally to Dr. Jackson's idea. We are coming more and more to develop the ideas Dr. Jackson has given us. All our appliances go back to the Jackson principle, consequently we orthodontists owe a great deal to him for the development of our appliances.

Dr. Victor Hugo Jackson, New York City.—As Dr. Bogue has just now entered the room, I will show again these slides of models of cases of Drs. Colignon and Barrett of Paris. Each had forwarded Dr. Bogue models with a history of his case. Each case with models was taken up for discussion at different meetings of the Odontological Society, of which Dr. Bogue was then President, and was published with illustrations as stated in the *Dental Cosmos*, 1887.

Both cases were referred to as having been corrected by the use of a *bite-plane*. We hope Dr. Bogue on seeing the slides will remember the cases and make further remarks regarding them.

We will first show the slides of the Colignon case.

The first slide represents the models showing upper protrusion and lower distal occlusion of the arches before correction.

The second slide shows the model of the V-shaped maxillary arch.

The third slide shows the model with the outlines of the maxillary arch improved with lateral expansion by a *split vulcanite plate*.

The fourth slide of the models shows the improved occlusion of the teeth after "jumping the bite," when the teeth were considered in normal occlusion.

We are now presenting three slides of the models of Dr. Barrett's case also considered at a later meeting as having been corrected by a *bite-plane*.

Hope that Dr. Bogue can present further particulars regarding the treatment in these cases.

Dr. Edward A. Boguc, New York City.—I have once more to make my grateful acknowledgment to Dr. Jackson for what he had done. I remember the conditions in connection with this case very well, and with your permission will try to recall them as well as I can. Dr. Colignon was one of the well-known practitioners in Paris and had been a medical man in his earlier days. He abandoned the practice of general medicine for dentistry, and has now transferred his practice to another operator. He said the only thing that remained for him to do in abandoning his practice, was to see one single patient who had been placed

in his hands for correction, was properly cared for; and he said to me, "Will you help me?" I replied, "I will, if I can." And this is the patient.

The first thing that suggested itself to Dr. Colignon, was that he should set a rubber plate on the lower teeth which would drive the lower incisors down. He did it and accomplished it. The next thing put on, was the screw appliance above, which broadened the maxillary arch in the premolar region, but it is only honest and fair to say that that was done empirically. I do not think he knew what he was doing, because he was trusting entirely to what I told him. I did not know why it should be done, myself.

Dr. Jackson.—I have given some of the conversation had with Dr. Bogue at the Society. We were all striving to know what had taken place, and there was a great deal of discussion about it at the time, and many questions were asked. Dr. Bogue asked who could give a suggestion as to what had actually occurred. This discussion is all in print, and I am sorry I did not call attention to this before, but Dr. Bogue will remember the circumstances because that discussion was really impressive to us all. Dr. Bogue has given us his description of what has taken place.

Dr. Bogue (resuming).—I thank you very much for what you have said. This discussion which has been referred to occurred before the Odontological Society of New York. I was President of the Society at the time, and showed the other set. Dr. Barrett had taken up the work. They had all seen and knew about this case. This was the first occlusion case of Dr. Barrett. Dr. Barrett sent a letter to me with these models and described some of the details. I noted some of them in my paper.

This is a posterior occlusion of the mandibular arch. Next, we have a plate which was a lingual plate with shelf, and I had understood a lingual shelf was on the other case too. I expanded the maxillary arch. The maxillary plate struck on the mandibular arch against the crowns of the mandibular incisors. Here we spoke of changing the angle of the jaws and how it might be possible to bring about normal occlusion by really changing the angle of the occlusion. There was a discussion about getting mesio-mandibular occlusion which from that time on has been a great problem with most of us.

Dr. George F. Burke, Detroit, Mich.—Was that done without intermaxillary force?

Dr. Jackson.—Yes, without what we now term intermaxillary force, that is with no more force than would be gained by the illustrated bite-plane during occlusion.

However, the inclined plane in occlusion draws forward on the mandibular arch as I have described in speaking of methods.

One can generally correct distal occlusion more quickly by utilizing both a lingual shelf and intermaxillary force with equalizing bands.

Dr. Kingsley states in his book that he did not know just what occurred. I would like Dr. Bogue to tell us in greater detail about the case referred to.

Dr. Edward A. Bogue, New York City.—I suppose it is permissible to bring forward everything that has occurred either before or after this event in elucidation of what we are searching for.

Dr. Jackson.—That is the object.

Dr. Bogue.—Dr. Stanton told me some time ago that by getting measurements of the entire set of maxillary and mandibular teeth, he found he was able to decide in advance whether or not there was sufficient material to make what we call correct occlusion; that he was sure of that. I am repeating the idea he gave me. He has often found that expansion alone, without the intervention of intermaxillary rubber, was sufficient to get the first molars into occlusion; that he could determine from measurements all the widths of the teeth. I find he is quite correct. But neither Dr. Colignon, Dr. Barrett, nor myself knew anything about these facts when these models were made. The whole thing was done empirically, and there was a successful issue to the case.

Now, I will tell you what occurred shortly afterward, if I may. A very distinguished gentleman wrote to me first when I was in London, to come to Paris as quickly as I could, as his daughter was in trouble. He brought her along. Her mouth was as much like the slides you have seen here as you can well imagine. I consulted with my old associate (Dr. Isaac Davenport) about the case, and I consulted with Dr. Levette about the case,

and he was one of the professors in the dental school in Paris. The result in this case was that there was an open bite. The molars only were in contact. I have these models in my possession from the beginning to the end. While I have a snapshot of the girl as she was before treatment was begun, they would never allow another photograph of her to be taken after the case was finished.

I will now go back to Dr. Ainsworth, who was Dr. Delabarre's preceptor, and the main point I remember he impressed upon me was this: You will find most of your troubles in the premolar region where the maxillary arch is always too narrow. Proceeding from that I have been following Dr. G. V. I. Brown's operation with a screw. As you all know, Dr. Brown has become an oral surgeon, but still he indulges in rapid spreading, in cases where the jaws are too narrow. He has said nothing that I could find of what he does with the mandible or with the lower arch, but he has spread the uppers precisely as these were spread, in the premolar region. He has obtained such an enlargement of the nasal passages by that process that he said to me one day when I was talking to him in Atlantic City, "I am growing up a race of giants around me." I said, "What do you mean by that?" He replied, "You are doing it yourself." Yes, I find spreading the nasal passages rapidly, results as Dr. Black, a rhinologist of Milwaukee asserts, in a dropping of the nasal septum between the two halves of the maxillæ, when they are spread apart, thus straightening out to a great degree the septum and increasing the nasal passages which afford greater entrance of air to the lungs, and the thoracic cavity is speedily enlarged. While this is a little bit off of the subject of bite-planes, it is the part which underlies what we are trying to do when we try to bring about good health.

Dr. Victor Hugo Jackson, New York City (closing).—I do not always agree with Dr. Bogue. From my experience, only a small percentage of *posterior occlusion* cases are changed to *full normal occlusion* by the lateral expansion of the dental arches. In certain cases, however, we do find in adjusting the parts that it results in Nature changing the angle of the mandible, bringing about normal occlusion. Generally, in these cases, intermaxillary force should be applied from the first.

I want to claim your indulgence for a few minutes to show the *movable model of the mandible in action* representing Figs. 17, 18, and 19, similar to cases of posterior occlusion that we have been discussing. The mandibular incisors are resting against the gum back of the maxillary incisors, and we see that intermaxillary force is required for its correction.

The maxillary molars will not permit the mandibular molars to rest on a higher plane. The incisors are antagonizing with the gum back of the maxillary incisors. Now intermaxillary force is set to work and is gradually changing the angle of the mandible. The angle is becoming more obtuse, this change of the angle bringing the mandibular incisors to a lower plane, causing them to occlude normally with the maxillary incisors, which is the principle involved in correcting posterior occlusion as described.

When the same intermaxillary force is continued too long changing the angle and causing the ramus to become too obtuse, it is an objectionable feature, this having brought about prognathism and final lack of incisal occlusion of the teeth. This prognathus condition would, if necessary, be corrected by reversing the action of the intermaxillary force, and in cases of *true prognathism*, in addition to this intermaxillary force described, force by a chin cap with cranial cap should be applied, correcting the angle of the mandible and causing it to return to more near a right angle.

In considering these laws of force for the movement of the teeth or changing the shape of a bone, it requires a steady continued force, which in effect, gradually softens or changes the cellular arrangement of the bone to permit the change, but when an intermittent force is applied, as is often applied for changing the shape of the mandible, it is ineffective. It generally causes the bone to become more dense, as the application of a force on the bone for eight hours and then leaving off the force for sixteen hours of the twenty-four would cause the bone to become more dense and better prepared to resist the force of eight hours. In other words, Nature in sixteen hours can build up and repair tissue to resist the force of eight hours, rather than causing the softening of the bone. Especially is this the case with the adult.

I want to thank you for your attention.

PROGNOSIS IN DISTOCLUSION CASES*

BY HUGH K. HATFIELD, M.D., D.M.D., BOSTON, MASS.

ANY MAN who has treated cases enough and practiced orthodontia long enough to have observed the end results will find in his collection the inevitable apportionment of failures which may be labelled somewhat as follows—classification correct, diagnosis incorrect, prognosis disappointing, unfortunate, fatal or something to that effect.

And an attempt to explain away these failures on the assumption that there exists today any deficiency in the available technical knowledge, would scarcely be warranted or accepted as a cause.

Although fine technic and skillful operative methods may enable us to bring about nice adjustments and anatomic alterations, failures will continue to multiply so long as we continue to rely *entirely* upon the occlusal relations of the teeth to give us our interpretations of the developmental conditions present.

Therapeutic measures which ignore these underlying conditions will prove at times wholly ineffective in the presence of factors which may not only hinder, but altogether upset the most painstaking efforts.

A keen observation of Leonardo da Vinci states it in fewer words, "There is," he says, "no result in nature without a cause, understand the cause and you will have no need of the experiment."

Do we understand the "cause" and is our knowledge of the etiologic factors of malocclusion extensive enough to deny the "need of the experiment?" Evidently some men believe themselves in possession of this "knowledge," for promise of definite results is given and claims as to absolute methods are made.

The probable source of this "knowledge," no doubt, lies in the belief of a universal endowment for each individual child, a right to a harmonious design in development, as a common heritage.

To assert that changing the occlusal relations of the teeth, no matter what the etiologic characteristics, would establish a condition sufficient in itself to realize this *ideal*, is to nullify our interest in orthodontia as a profession in the field of medicine and to give it over to the craftsmanship of the artisan or mechanic.

If such were the nature of the orthodontic problem a prognosis of a successful result in *any* distocclusion case would be justifiable and safely made.

What does prognosis mean? An opinion given in advance.

It is an opinion expressed in advance of the probable course and termination of a disease and the probable modification of the course and termination as a result of treatment.

*Read before the American Society of Orthodontists, Atlantic City, April 27-30, 1921.

Prognosis should come before treatment but the arrangement of the programme for this meeting today singularly reflects the relative position prognosis must hold in our orthodontic procedures for the present.

Postmortem perhaps might be substituted for the term prognosis for some time. It is evident that the knowledge at the present time utilized as a basis for prognostications is entirely of a statistical nature. For if the assertion be true that comparatively few of our distocclusion cases are failures, then some computation has undoubtedly been made.

Let us grant that a large per cent of distocclusion cases terminate in a successful result. Does that give us anything definite and of value as an aid in prognosis?

It may aid in prognosis to the extent of admitting a reasonable probability of success, but little more. One might say that the prognosis in distocclusion cases is probably good or favorable, but of course will vary according to the nature of the factors which cause it. Or, that in cases of undetermined origin the prognosis is good, if the proper treatment is carried out.

We would be safe in saying that prognosis is good insofar as the possibilities of development will allow. All of which is camouflage for ignorance and not likely to promote valuable contributions to our knowledge of the significance of prognosis or give much in the way of comfort to the family. This group of distocclusion failures must be critically analyzed and the knowledge gained from such an analysis must be sufficiently comprehensive to enable us to distinguish them in their early stages from those that will terminate successfully. When this is clear then will it be possible to indulge in the art of foretelling the course and termination of the specific case of distocclusion.

To express the situation briefly and bluntly—in the absence of any exact knowledge of the peculiarities of development which can be applied in the individual case, the orthodontist must in many cases blunder along with a mixture of happy hits and unfortunate misses. One of several large obstacles, I hope not insurmountable which has stood in the way of progress, is our attitude toward classification. There is a tendency to regard it as a finality. We forget that all knowledge is a classification of experiences and that our acquisition of knowledge is a progressive establishment of distinctions. The ultimate perfection of knowledge would be the recognition of all the distinctions which exist between phenomena.

Angle's classification is a general classification and we should recognize and use it as such. It distributes malocclusions into various groups which appear alike in their occlusal aspect. But if we could make a qualitative analysis of the different groups or classes, it would bring out and show each member of the different groups or classes to vary in character.

It has been repeatedly noted that two cases of distocclusion will respond to the same method of treatment so differently that if the difference in response could have been anticipated, the line of treatment could have been correspondingly modified. Because of the variability in the nature of the different cases of distocclusion we are called upon to treat, inter-maxillary

elastics are no longer the invariable and indispensable thing in all treatment of this class. But the nature of this characteristic is not indicated in the occlusal relations, as expressed in the classification. We have advanced little beyond classifying them relative to the most prominent symptom, a physical sign which shows that an alteration of structure has taken place, but yields little information regarding the nature of the growth processes present, peculiarities of physical development or degree of mental stability or functional conditions in the individual.

In every field of medicine, including orthodontia, the individual will always be our problem; to understand the causes of his complex organization, to know how and in what way he differs from all the others in the group with similar occlusal relations. Such is the kind of knowledge we need to make a prognosis. Knowledge that will enable us to decide upon a line of treatment with a clear perception of the consequences.

Sir James MacKenzie in his recent book "The Future of Medicine" says in reference to prognosis: "The attainment of its knowledge puts the coping stone on the whole system of medicine, and all the other branches are contributory to it.

"It demands a knowledge of the cause of a disease and of its progress from start to finish, of the reactions of organs and tissues the one upon the other, and of the effects of remedial measures in modifying the progress of the disease."

Etiology then must claim first place in the consideration of prognosis, and there seems no lack of sufficient evidence of the truth of the statement, that it is only after the etiologic factors of distocclusion have been precisely determined and understood in each individual case, that we are in a position to anticipate the probable response to therapeutic measures or to truthfully predict the course and termination—the end result.

Whether or not specific causes can ever be assigned to the various disturbances of form seen in the dental arches, further advance in this field is imperative if we are ever to acquire the knowledge which will enable us to differentiate between those cases which are susceptible of successful treatment and those which are not, or still more important, to distinguish those cases which require treatment from those which do not.

Because certain clinical pictures of structural relations do not meet the requirements of what we assume the normal to be, does not at all times, without further consideration, justify treatment.

The accompanying illustrations from Keibel and Mall's Human Embryology, will show how a normal stage of growth may present an apparent mal-relation of parts, whereas only when it persists or occurs at another period is it abnormal.

Fig. 1, head of a fetus 42.5 mm. seen in profile, Chapter VI. Development of Human Embryo, Fig. 71, "In the profile view the great development of the forehead region is striking and below this the root of the nose is deeply depressed.

"Finally the profile view of the head of a fetus 117 mm. in length may

be shown (Fig. 2) and in it I would draw especial attention to the projecting upper lip and the receding chin, to the double lip and to the shape of the nose.

"In the first half of the third month the two lips project about equally (as seen in Fig. 1) but later the border of the upper lip, and the lip itself grow more rapidly so that in the fourth and fifth months it projects markedly beyond the lower lip (Fig. 2); by a stronger growth of the lower jaw and lip this difference is gradually overcome in the sixth to the ninth months but by a kind of inhibition process the early fetal arrangement may be retained in the adult to a marked degree."

Only ignorance of the developmental conditions normal for this period could mislead one to believe this to be an early stage of malocclusion. Later stages of growth in children between the ages of four and six or eight may show certain positions of the teeth, and width of the jaw or structural relations disturbing when measured by a preconceived notion of the normal and regarded by some men with unwarranted apprehension.

How slow our progress has been in correctly estimating the significance



Fig. 1.

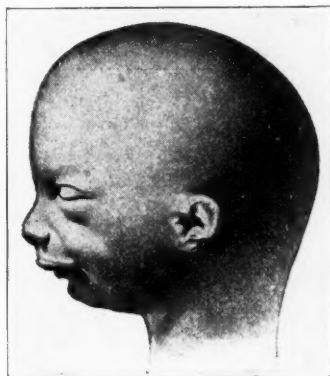


Fig. 2.

(After Retzius.) (Keibel and Mall.)

of these physical signs, may be shown on reading the observations of men surveying the same field one hundred years ago.

To quote Wedl's: *Pathology of the Teeth, Growth of the Jaws. Changes in the jaws during the second dentition:*

"Hunter was the first to assert that in the portions of the jaws in which the milk teeth are placed growth ceases after the completion of the first dentition.

"Fox agreed with him substantially. They reached this conclusion by measurements of macerated lower jaws.

"Delabarre—(Second Dentition) 1819—on the other hand endeavored by means of clinical observations to establish the fact of the growth of the bone in length after the first dentition.

"He asserts that, at the age of five to six years, the milk teeth separate from each other and says, that those people with whom this does not occur are *liable* to have an irregular second dentition.

"Fox had recognized this occurrence before Delabarre, but did not give

to it the same significance, for he states; the anterior portion of the jaw undergoes scarcely more than an alteration in form, it adapts itself to the permanent teeth there situated and scarcely receives any increase in size.

"Bell asserts emphatically that no reliance can be placed upon the comparison between jaws of different individuals.

"The only way to get at the truth of the matter is to examine the same jaw at different ages and then compare results."



Fig. 3.



Fig. 4.



Fig. 5.

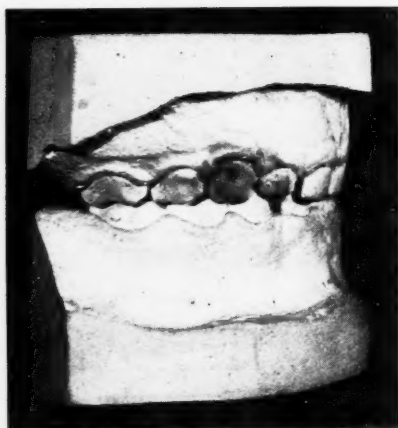


Fig. 6.—Right.

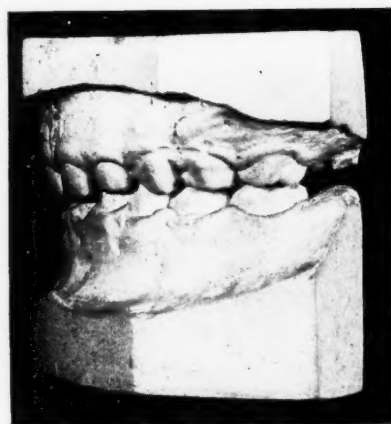


Fig. 6.—Left.

The studies of these men are in many ways in advance of current opinion today. Their observations were extensive enough to show the variability in growth processes and the varying degrees of development in individuals of the same age. Their opinions were less dogmatic which considerably enhanced their value.

A common fault today is the habit of hasty inference from a few data and as a result all emphasis has been placed on evidence to show cases developing one way, that is unfavorably. In striking contrast with this biased view

is Kemple's contribution which proved the presence of many so-called diagnostic signs of malocclusion is *not always* to be judged sufficient evidence for a prolonged course of treatment. The true way to assess the value of these

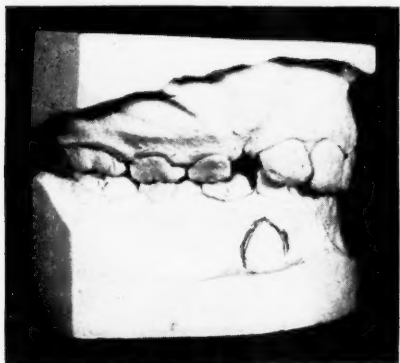


Fig. 7.—Right.

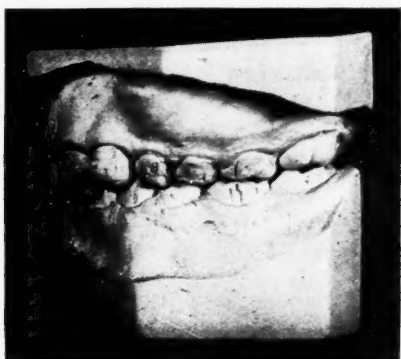


Fig. 7.—Left.

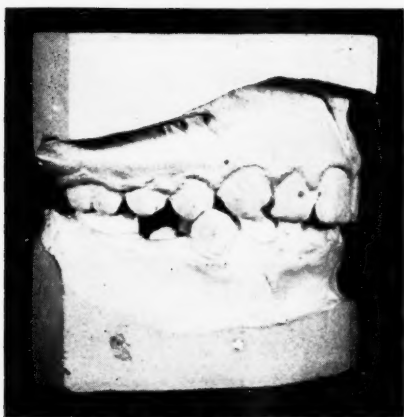


Fig. 8.—Right.

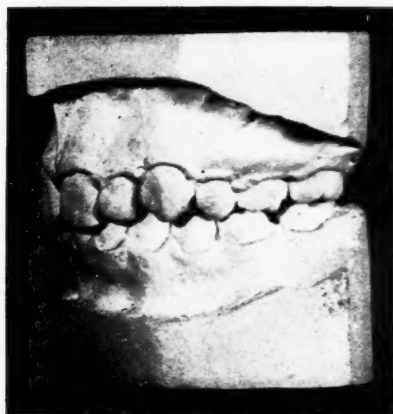


Fig. 8.—Left.

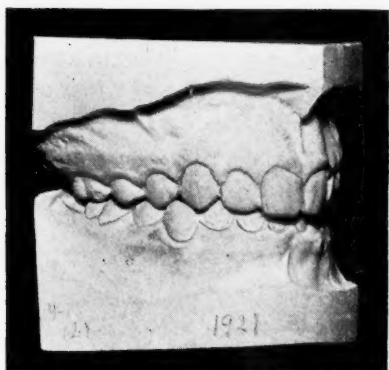


Fig. 9.—Right.

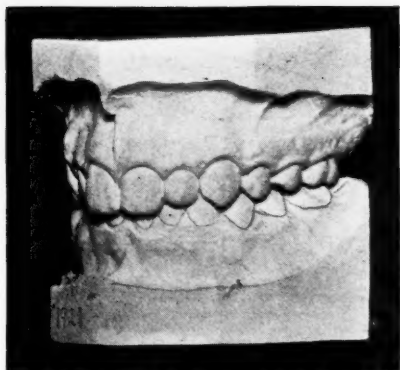


Fig. 9.—Left.

signs is to watch individuals for long periods and to find out what will happen if the condition is left untreated.

The accompanying illustrations (Figs. 3 to 9) are from my own collection of cases under observation, developing without interference or appliance of

any kind. There were no spaces between the deciduous teeth. The child was six years old when first impression was taken. The width between the second deciduous molars was 25 mm.; mandibular deciduous second incisor lost on eruption of permanent first incisor. Mandibular deciduous canine lost on eruption of permanent second incisor. The period of observation covered is indicated by the dates on the models.

DISCUSSION

Dr. Frederick C. Kemple, New York City.—I had not intended to say anything on this paper, but Dr. Hawley looked over at me, smiled significantly as much as to say, "I told you so," and I remarked to a member sitting near me that this is another splendid bit of evidence that one cannot predict just what is going to happen because the teeth during the period of transition or earlier are in malocclusion or appear to be so. I do not see that it is necessary particularly for me to attempt to discuss Dr. Hatfield's paper. He has shown very clearly by this bit of evidence that one cannot predict what is going to take place. Of course, we all know that if that child had fallen into the hands of many of our good friends, perhaps my dear friend Dr. Bogue, he would have had years of treatment and the orthodontist would have patted himself on the back and said, "See what I did."

Now, it is not wise to accept one bit of evidence like this or the bit of evidence I have shown in some models that have shown natural development, where improvement has taken place just as rapidly as it could have been safely induced by treatment, and very much better. It is not safe to accept these bits of evidence as conclusive proof that all of these cases are going to develop satisfactorily. I think it was Dr. Lourie who spoke to me a short time ago about a case that came under his observation where the deciduous denture was as nearly up to the standard ideal scheme as any I believe he said he had ever seen, and during the development that followed, a severe condition of malocclusion resulted. That is just the reverse of such a condition as is shown in this illustration of Dr. Hatfield's. It simply adds another bit of evidence to Dr. Hatfield's statement that we cannot predict what will take place through natural development, but it has been my contention that if satisfactory development does not take place, treatment later will result in almost all of these cases, certainly in the great majority of them, in just as satisfactory occlusion as you would have obtained if you had started the work very much earlier.

It is well enough to speak about giving a child an opportunity to develop physically and mentally, but these children are subnormal in school, they are subnormal physically, etc., but every one of you know that you have any number of patients in your own practice who have severe conditions of malocclusion, who are brilliant mentally and splendid physical specimens so far as you can see except this one manifestation of malocclusion. By treating these children early you are not going to eliminate the insane asylums or prisons. We are not going to get rid of criminals. I venture the assertion that if you take casts of hundreds of the professors in our best universities you would find all kinds of malocclusions in their mouths. They are not subnormal mentally. As Dr. Hellman said in the first part of his paper, we take too much for granted. We assume too much. We postulate too much. We make dogmatic assertions. As Dr. Hatfield pointed out, we are behind the men who made broader-minded observations a hundred years ago.

I am very pleased to have heard this paper and have been given the opportunity to speak on the subject.

Dr. Horace A. Howe, Boston.—I would like to ask Dr. Hatfield about the measurements of this case he treated, and whether it was a borderline case in width at the beginning or not. I think none of us would attempt to treat one of these borderline cases, and I would like to know whether the measurements were far below 28 millimeters or not, or whether it was about 20 millimeters across.

Dr. Hatfield.—This case was not treated. What do you mean by a borderline case?

Dr. Howe.—I mean 28 or 29 millimeters.

Dr. Hatfield.—It measured 25 millimeters, and was therefore not a borderline case according to your definition.

Dr. Howe.—What is it at present?

Dr. Hatfield.—I do not know.

Dr. Delabarre.—May I ask Dr. Hatfield a few questions and crave his answers before I discuss his paper? This case, I take it, is still under observation, is it not?

Dr. Hatfield.—Yes.

Dr. Delabarre.—Do you present it as a case which shows normal or nearly normal development at the present time?

Dr. Hatfield.—No. I present it as a case under observation.

Dr. Frank A. Delabarre, Boston.—We all look at these cases differently. Some of us will see things in a case that others of us miss. May I give you my observations of the slides which are insufficient evidence on which to base a complete opinion. Nevertheless, I saw in that last slide and some of the preceding ones some evidences of a disturbance of occlusion which are still present. May I outline them to you?

We all know it to be a fact that in growth and development there is a forward and downward movement in the development of the mandible and maxilla. It is astonishing to me to see this evidence as you present it where the deciduous canine and the deciduous second incisor have been forced out of place by the eruption of the permanent first and second incisors with a resulting closure at a definite age of the space that should be reserved for the permanent canine and then the development going on and picturing the permanent canines and premolars coming into apparently correct position. The question arises in my mind and I admit it is a question, whether the development of the mandible and maxilla here has proceeded in a normal downward and forward direction as usual, or whether the environmental forces which have controlled development have not resulted in a stationary position of the permanent incisor and canine teeth, or even a backward movement toward the first permanent molars. These are questions which I cannot answer, and I doubt whether Dr. Hatfield can answer them. We should not base conclusions on evidence that is incomplete. I acknowledge that in our present state of etiology the evidence is absolutely insufficient on which to base, in the first place, a complete diagnosis and a reliable prognosis, and that our treatment of today as well as in the past must of necessity be more or less empirical. It must be experimental rather than scientific and exact. To me from the evidence that has been shown, the argument that has been advanced against the early treatment of cases of malocclusion is not sufficient to deter us from giving these individuals that come to us what relief we can from the bad influences which are antagonizing the proper growth and development.

It has been said that we are not going to empty our insane asylums through any effort we make irrespective of the age at which we begin our treatment. Do you think all insanity comes from peripheral irritations? Do you think its causes arise from conditions in the mouth alone? It is absurd, gentlemen, to think so. No such claim has been made, and I want you to think the evidence Dr. Bogue has given you here today is only a modicum of what he might present to prove absolutely that the cases that have gone through his hands have shown a wonderful improvement in the physical and mental aspects of these patients. The laity do not ask for scientific proof. They do not care about the instruments you use or the methods you employ; they are looking for results, and the gratitude of one mother for the benefit that is given to her child through your efforts is adequate compensation for anything that you may attempt to do.

Dr. Lloyd S. Lourie, Chicago.—It is unfortunate that the benefit of so many good things is neutralized by indiscriminate use. The teaching of Dr. Bogue, I consider, has been of inestimable value to our specialty. Do not let us lose the benefit of it by having it reflected upon through a wrong application of it. I believe there are some cases that should be early interfered with, while there are other cases in which early interference is not justified, and certainly there are cases in which, as Dr. Delabarre has just pointed out, the prognosis is undoubtedly and entirely empirical. Let us suppose the prognosis must be em-

pirical. Does not that argue in favor of delay instead of advising early treatment? Those are the cases in which we are not justified in interfering, where there is any doubt about it. The discussion this morning showed there is doubt in some cases as to whether interference is necessary, or whether there might be development without interference. From what Dr. Delabarre has said concerning these cases, where the prognosis must necessarily be empirical, it seems to me it is advisable that we should be more sure of the tendency of the individual case we have under observation. This report of Dr. Hatfield's is a very helpful contribution, and I make it a practice where there is doubt to take study models and keep records of them, and then I have the tendency of that case showing. In the case shown by Dr. Hatfield there is a tendency to improvement. It is not my understanding that he presented it as a finished case. It is under observation, showing that in some cases there is a tendency to improvement. Dr. Bogue has cited cases in which during six years there has been no tendency to improvement. That is not proof that after six years there may not be a tendency to improvement. I am not making these remarks because I am on the fence, or to agree partly with one and partly with the other side of the question.

Let me cite a case in which I would feel we would not be justified in interfering mechanically even though the deciduous arch showed no development of the spaces between the teeth at all, even at five and a half or six years of age. I have seen many of them in which, to my mind and my way of analyzing the case, there was satisfactory development going on in the arch supporting the permanent teeth. You find the premolars and canines developed well buccally to the deciduous teeth. If you put appliances on these deciduous teeth, any one will have to admit that they may do good in some respects, although they must be objectionable in others. They must interfere somewhat with function, and many times a great deal. I think it would be well in those cases to adopt the procedure which has been followed by Dr. Hatfield in the case just shown. I make record casts and keep the case under observation. I believe function is just as important as any mechanical stimulation, and certainly these teeth will perform better service if they are not disturbed than if appliances are put on, more or less loosening up and interfering with them. If the premolars are directly above the deciduous molars and are located in the roots of them, and you are able to carry these teeth out buccally by the expansion of the deciduous arch, is it not equally true that if these permanent teeth lie buccally to the deciduous arch you will carry them buccally beyond where they should be?

Dr. Bogue.—I would like to ask Dr. Lourie; for whose opinion I have the utmost respect and admiration, a question: Did he ever see a premolar lying buccally to the deciduous molar? I ask for information, but not in a critical or fault-finding spirit.

Dr. Lourie.—The idea I meant to convey was that the alveolar process or structures carrying the permanent teeth lie buccally to the alveolar process carrying the deciduous teeth, which would indicate to me a greater development in the arch carrying the permanent teeth than there has been in the structures bearing the deciduous. I do not know that I can say definitely that I have seen premolars lying buccally to the deciduous teeth. It has occurred to me that I might make a definite record of that condition by taking radiographs of it from above the teeth.

Dr. Bogue.—I wish you would.

Dr. Lourie.—I will gladly do that. The point I wished to make was in this case I would be doubtful as to the necessity of early interference, and I would feel safer in giving my advice about such a case to have record models of it at varying periods and be able to determine the tendency of that case. If the deciduous arch is not enlarged before shedding, there still might be plenty of development of the permanent denture.

While I am on my feet, I will say that Dr. Kemple mentioned a case about which I had spoken to him. That case was so typical of the conditions that Dr. Bogue wishes to have created as normal, or as satisfactory I had better say. The development spaces were all there and were beautiful specimens of what I considered to be normal occlusion at that age.

Dr. Bogue.—What was the age?

Dr. Lourie.—Five and a half to six.

Dr. Bogue.—Were the teeth standing regularly in the arch?

Dr. Lourie.—Regularly. I asked the mother to allow me to make record casts of it, but for some reason or other she did not come to the office. There were four boys with malocclusion in the family, and it was thought the girl would escape but she did not.

Dr. Bogue.—Irregularity?

Dr. Lourie.—Yes.

Dr. Edward A. Bogue, New York City.—In these discussions we ought not to be dogmatic. We are learning when we come here, and show our errors. I did not bring to you the special things that Dr. Dewey was kind enough to speak about. I told him what I had done and what I was doing, and he said, "Will you read a paper on the subject before the American Society of Orthodontists?" I told him I would talk it, that I would not have a formal paper. I told him I had all the models from the beginning to the end.

I showed the photograph of the little boy, five and a half years of age, on whom I put appliances. His photographs were much better and handsomer than those I had here today. They show greater physical improvement of the boy. A sister came the same day as the boy, to see me and had her impressions taken, and I told the mother I would not touch her, but I have been getting impressions and models of her right along. She is not developed nearly as well as the boy. I put no apparatus on her and did not want to.

Dr. Lourie, I think said, that I had shown teeth up to six years of age with no improvement in their position; I don't quite remember the words he used. On more than one occasion when I have taken impressions of deciduous teeth and permanent ones as well, I have found that in from six to ten years there has been no increase in lateral growth. That is all I have ever undertaken to say. I experimented a bit and then I came to the conclusion eventually that those cases were instances of arrest in development, and now I am setting myself at work to see whether I can again start development, and if so, how, and I tried to mention it. I can think of various cases from three to six years of age without lateral growth, but after making that lateral spread of the teeth mechanically the child has grown enormously. I have I think four such cases on hand at this moment, who are taking glandular extracts as well as exercises. They are all growing, and before that, they gave the promise of being almost dwarfs.

Dr. Kemple.—I would like to ask Dr. Bogue if he has not observed many other cases where there has been ample lateral development.

Dr. Bogue.—Yes, those are the cases I do not touch, because the maxillary dental arches measure 28 millimeters or more in width.

Dr. Kemple.—But you have watched the growth and observed lateral development from year to year.

Dr. Bogue.—Yes, and from that I have deduced that with 28 millimeters or more in width, lateral growth may be possible. We ought to have 35 millimeters across the palate between the second deciduous molars, or the second maxillary premolars.

Dr. Kemple.—Dr. Hatfield has one here showing 25 millimeters.

Dr. Bogue.—That child needs development. That child with 25 millimeters across the mouth has not the vital energy to become a normal person. How are you going to give it vital energy? How are you going to prevent the child from stooping over and having curvature of the spine? How will you put into that child's head the brain that ought to be there? That is what I mean, and it is simply we do not understand each other clearly when we try to express our thoughts by means of that language which is given us to conceal thought.

Dr. Kemple.—I would like to ask whether the child whose model you have shown was developed physically or mentally.

Dr. Hatfield.—Mental development is a hard thing to determine.

Dr. Kemple.—Did the child measure up to the average?

Dr. Hatfield.—Yes, I think so.

Dr. Boguc.—May I venture to say to Dr. Hatfield, he mentioned Fox, Hunter and others. I have them all. He did not mention Murphy, who said in 1811, that it is perfectly well known that proper care of the deciduous teeth will develop the permanent ones as they ought to be.

Dr. Hugh K. Hatfield, Boston.—I have nothing further to add to what I have already said. Dr. Delabarre's remarks it seems to me emphasize the very point I wish to make that a more careful assay of symptoms and prognostic signs must accompany all treatment. We have placed too much emphasis on signs *said* to point invariably to malocclusion as the evidence I have presented clearly indicates.

In this particular case shown it seemed to me there was a chance for a good development. I have appliances on two other children in the same family, treatment being carried on while this child was under observation. There is such a variability in the manner of development in different children and perhaps I was wrong in putting appliances on the other children.

DEPARTMENT OF DENTAL AND ORAL RADIOGRAPHY

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DENTAL INFECTION IN SYSTEMIC DISEASES*

FACTS THAT OUR PATIENTS SHOULD KNOW, WITH SPECIAL REFERENCE TO
RADIOGRAPHIC DIAGNOSIS

BY SINCLAIR TOUSEY, M. D., NEW YORK CITY

IT IS no new thing. Benjamin Rush over a hundred years ago cured cases of rheumatism by ordering the extraction of infected teeth. It is a new discovery that dental infection may exist for years without local symptoms, pain or swelling; and that the majority of the patients at Richfield Springs and similar sanatoria are there because of dental infection. Many of these patients obtain temporary benefit from hydrotherapy and electrotherapy; and most of them could have been permanently cured by the timely discovery and cure of the tooth infection. Even now a cure or permanent benefit may probably be obtained by dental treatment. Probably in many cases the dental infection could have been found by the dentist before the days of the x-ray, but now this examination shows it in many cases as clearly as it shows a fracture of the bones of the leg.

A case from the author's own practice was a lady referred by Dr. Albert H. Ely more than a dozen years ago. She had sciatica and also myositis with painful nodules in the muscles of the back, neck and calves. The only relief was obtained from high frequency currents applied from glass vacuum electrodes, vibration, and the static bath and head breeze. The amount of suffering was evidenced by the tears in her eyes and by the time and money she spent on the treatments year after year.

When we discovered dental infection as the usual cause of such cases I supposed she would be one of the first to be benefited. But no, "You want

*Read at the Thirtieth Annual Meeting of the American Electrotherapeutic Association, at Atlantic City, Sept. 17, 1920.

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me to have all my teeth pulled out," and it was years before she would have them examined with the x-ray. Then I found several infected teeth, some of which were treated and some extracted by the dentist. This was followed by a year of freedom from suffering. Again this last winter she came with tears in her eyes, but the trouble "could not be due to her teeth." "It was brought about by great family distresses." And not until after a winter's electrical treatment was another x-ray examination allowed and an infected tooth discovered.

An oculist in a New England city recently asked the author whether physicians were hard to convince of the necessity for x-ray examination of the teeth and said that he had found it so. Knowing and proving in case after case that iritis and other eye troubles are commonly due to dental infection, the oculist still had a struggle with many physicians who had not seen a demonstration in their own practice. The great medical leaders in every part of the country can perform a wonderful service by spreading the knowledge which will save so much suffering and so many lives. The time has not come



Fig. 1.—Dental infection in a case of long standing myositis.

in civil practice when the system of our army in the war may be enforced. There no diagnosis of "rheumatism" was accepted. It was sent back with an order to report it as myositis, arthritis, or neuritis, etc., and with orders to make such examinations as were necessary to find the infection which the arthritis, etc., was caused by and if possible to cure the infection.

I believe the time is not far distant when a patient will feel aggrieved if a physician lets him hobble around for years with a painful knee without explaining the desirability of an x-ray examination of the teeth.

We need not expect every physician or dentist to become convinced. But if the policeman's club and fines and the prison cell had not been used to enforce the sanitary regulations in Cuba and the Panama Canal Zone and we had waited until everyone there had been convinced that mosquitoes inoculated persons with yellow fever and malaria, those diseases would never have been stamped out.

I understand that the federal health authorities suspect the prevalence of dental infection to be the causative element in the spread of influenza in the

recent terrible epidemics. It seems entirely reasonable that these germs or any others which enter by the mouth or nostrils should find a favorable site for lodgment in these infected dental cavities. If one had a pool of putrid animal matter where it could receive fecal and other discharges from every passing traveler and where it could contaminate his own water supply, infection would be a perfectly natural consequence.

A dead and putrified nerve or tooth-pulp is full of germs from which poison is absorbed into the system, it may be for years, since the pulp-chamber in the tooth cannot collapse like the walls of any ordinary boil or abscess and the lesion undergo spontaneous cure. The amount of absorption from an abscess at the apex of the root of a tooth is not indicated by the small size of the abscess cavity but by the rapidity with which the poison is generated and the freedom with which it is communicated to the blood. The free bleeding which ordinarily ensues when a tooth is extracted illustrates the anatomical fact that the tooth is not like an inanimate glass plug in the tooth socket but is a vital organ with blood vessels which must be torn wide open in order to extract it. Through this



Fig. 2.—Dental infection in a case of optic neuritis with dimness of vision, "a film before her eyes," cured by extraction of the infected teeth.

free blood supply the poison from a blind abscess is poured into the system at a speed of which we can obtain some idea from the other cases of dental infection, pyorrhea. In the latter case we may be able to press a large drop of pus from the pocket surrounding the root of a tooth every five minutes.

Two kinds of poison are absorbed; the germs themselves and toxins or their poisonous products. The germs enter the blood, but there they are ordinarily destroyed by certain white blood-cells called phagocytes; and even in many cases of serious or fatal disease unmistakably due to dental infection, the germs do not grow and multiply in the blood and may not be discoverable in it. This is true in regard to certain other germ diseases. For instance, in a case of tuberculosis we don't look in the blood but in the sputum for the tubercle bacilli. When the normal resistance of the blood to invasion by the germs from a focus of infection has been lost or greatly reduced, then the germs may multiply in the blood and usually with a fatal result. A pint of blood drawn from the body, cooled and therefore devitalized, may be experimentally infected with the

pus from an extracted abscessed tooth and if kept at a temperature of about 100 degrees F., will in a few days become a mass of living and multiplying germs sufficient, if divided up in hypodermic doses, to kill a company of 100 soldiers.

In many cases where the germs never succeed in growing and multiplying in the blood, some of them are carried by the blood and lymph to places where they form a secondary focus of infection. Such a locality is the heart valves, where a clot or vegetation may form, full of the living and multiplying germs. This occurrence is commonly the beginning of a lingering and painful death. Fragments of the infected vegetations break away and are carried by the blood, and blocking up small arteries cause paralysis, pneumonia, and a host of other complications affecting every organ and function of the body. This painful and hopeless illness in bed often lasts several months and all the time there is a possibility of sudden death from blocking of a large artery in the brain.

Happily a dental abscess almost always produces symptoms due to absorp-



Fig. 3.—Pyorrheal pockets from which a drop of bloody pus could be pressed every 5 minutes.

tion of poisons before any direct germ extension takes place. These symptoms are as manifold as the different organs to which the blood carries the poison. Seldom are two persons affected in exactly the same way. Some of the subjects have high blood pressure with a tendency to result in hardening of the arteries and finally apoplexy and death. Others have one or other of the different lesions and symptoms called rheumatism. Others have neuritis, neuralgia, various eye troubles which formerly seemed to be due to rheumatism. One eye has even been saved by the treatment of a tooth abscess discovered too late to save the other. Indigestion is a common effect. And there is a general agreement with the Mayos that ulcer and cancer of the stomach and cancer of the gall bladder are usually due to dental infection. Skin diseases and insanity are in many cases due to dental infection. A complete list of conditions which may be caused by dental infection would be a very long one.

We often hear the remark that this is a temporary fad like removing the tonsils for rheumatism.

And again the physician who recognizes the possibility and even the strong

probability that the patient's symptoms indicate the presence of dental infection too often is told, "You want me to have all my teeth out."

It is true that many cases of rheumatism and other diseases are due to infected tonsils and that many persons have been cured by removing the infected tonsils. That was not a temporary fad but is today often the means of restoring health and saving lives.

We know that the teeth also are a source of infection, and we know that a focus of infection may sometimes be found in the pneumatic sinuses and that sometimes autointoxication may develop from primary intestinal conditions.

These facts do not make it a fad to examine the tonsils or the teeth or the sinuses or the intestines and to cure any focus of infection that is discovered. Particularly in regard to the teeth, the x-ray enables one to acquit the healthy teeth and it certainly would be a fad to go ahead and blindly extract all the teeth good and bad in a case of rheumatism.



Fig. 4.—Dental infection in a case of exophthalmic goiter, cured by x-ray after extraction of infected teeth.

That the different diseases and symptoms referred to, are often caused by a focus of infection and that many of them if taken in time are cured by the eradication of the focus of infection is not the theory of one person or of any group of persons. It has been tested and proved by many physicians, surgeons and dentists in many different countries. The tests as to causation have been similar to those establishing the fact that typhoid fever is caused by typhoid bacilli and cholera by the cholera bacillus.

A great variety of symptoms are known to have dental infection as their frequent, common or even usual cause.

These symptoms may not be serious in themselves and, if they are due to dental infection, that cause may be left undiscovered and untreated for years.

Delay in the discovery of the dental infection may be because the idea had not occurred to the physician, or the patient may delay the x-ray examination because of the fear of having to have one or more teeth extracted.

This delay cannot possibly enable the infected tooth or teeth to become normal. It simply results in their getting worse, and whereas at an early

stage the dentist is often able to treat and cure and preserve an infected tooth, an advanced stage may be reached where only extraction is possible.

The sooner an infected tooth is discovered and cured the greater is the hope that others may not become infected.

The idea used to be that an old snag of a root ought to be preserved at all hazards to prevent absorption of the alveolar process and falling in of the cheek. This is a dangerous theory and in actual practice many a patient has been poisoned by pus from an infected retained root. And the x-ray has often demonstrated extension of pyorrhea from such a root as the cause of destruction of the alveolar process of a neighboring tooth. A perfectly good tooth may be sacrificed by clinging to a dangerous and useless root.

The lower bicuspid apices are close to the mental foramen, an opening in the lower jaw through which a nerve passes to the chin and lower lip. A photograph or a radiograph of the lower jaw of a skeleton shows this opening in an unmistakable way, but the foramen has no such characteristic appearance



Fig. 5.—Root which should have been extracted and which has caused pyorrhea of a neighboring tooth.

in a radiograph of a living person. Indeed it often looks very much like a periapical abscess of the second lower bicuspid and has doubtless been frequently mistaken for one. It is only necessary to be on one's guard against this error and in case of doubt to make a radiogram of the second lower bicuspid on the other side of the face. An identical appearance of the right and lower left second bicuspids would be the strongest indication that the appearance was a normal one due to the mental foramen.

It has long been known to the author that a vital tooth may show periapical infection, and he has made a radiographic diagnosis of periapical infection in teeth which were vital, some with and some without pain. A lower molar pulp may die in one root-canal and be alive in the other and in the pulp chamber. As a rule if the radiographic appearance is doubtful it is recommended that the vitality of the tooth be tested by heat or cold or by faradism. And if found to be vital the tooth is given the benefit of the doubt. Where, however, the x-ray appearance is unmistakable, even though the tooth may respond to the heat and cold and faradism and be exquisitely sensitive when drilled into, then the

interests of the patient require that the nerve be killed or the tooth extracted. The latter would be called for if the radiogram showed such a bending of the root that disinfection of the root-canal and of the periapical abscess cavity would be impossible. With pain and swelling, in fact with the ordinary symptoms of a dying nerve, the dentist has never been at a loss as to the proper treatment. But without the x-ray it is not always possible to determine promptly which tooth is affected, and the author has walked the floor 12 nights while a tooth four spaces from the affected one has been treated. It was a case of the shoemaker's children going barefoot and the moment a radiogram was made the error was discovered. Even in the right tooth the x-ray will sometimes be

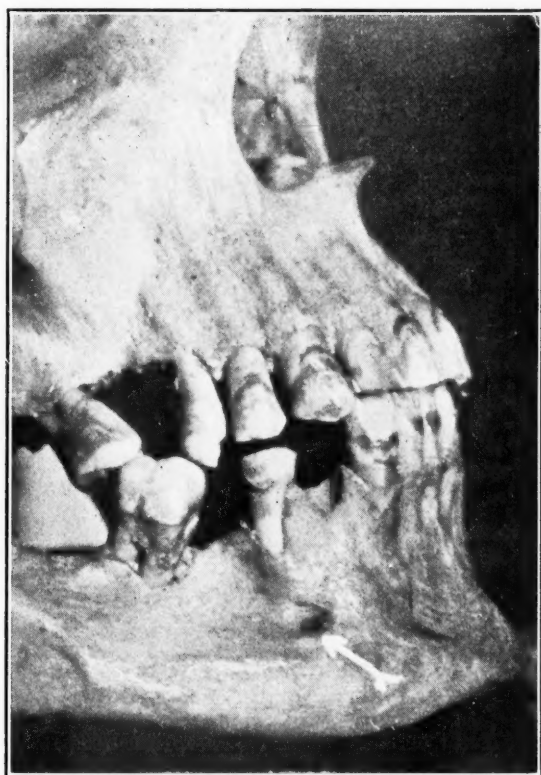


Fig. 6.—Photograph of skeleton jaw showing mental foramen.

required to trace the root-canal and the way direction, it enters the abscess and pus wells up into the pulp chamber. Figure 8.

It is the cases of vital pulp without pain or swelling but with unmistakable x-ray evidence of periapical abscess, that are the most difficult for the dentist to decide about and he may very probably ask to have another corroborative radiogram made before reaching a decision. A very important discovery has just been announced by Hartzell and Henrici to the effect that pathogenic germs are often found in the vital pulps of the teeth affected by pyorrhea or having carious cavities. Their experiments were conducted in such a way as to apparently prevent artificial infection of the pulp and in 26 healthy teeth ex-

tracted and opened in the same way the pulps were all found aseptic. This agrees with my own observation of many vital teeth with periapical infection.

From some cause the radiogram of a dead tooth which has been treated and filled may show the root-canal only partly filled. This appearance may be due to the use of a transparent filling material or to the filling being actually incomplete. In the latter case a space remains permanently which is exceedingly prone to infection. And where there are symptoms of infection it is often necessary for the dentist to treat the root-canal and fill it completely.



Fig. 7.—Radiogram as a guide to the dentist in opening an apical abscess through the root-canal.



Fig. 8.—Dental infection as the cause of high blood pressure, neuritis, apoplexy and death.

Many authorities favor the extraction of every dead tooth, but there are many others who believe that a dead tooth can often be sterilized and be kept in that condition for many years and for all that time be a harmless and useful member. A dead tooth is of course always under suspicion and to be kept under occasional x-ray observation. At first indication of its being infected, treatment through the root-canal should be instituted and if it becomes infected time after time for a period of years, the rule seems to be; what can't be cured must be extracted. Of course many a time the radiogram reveals such an extent of

necrotic bone, or the symptoms of systemic poisoning are so severe that one's effort should not be to save the tooth but to save the patient.

The condition in which the tooth is found after extraction is an important subject for consideration. The tooth itself may in some cases appear normal, or close scrutiny may show a small area at the foramen where the natural smooth surface is lacking. We know that an infected root-canal and an infected periapical space causing systemic infection do not necessarily involve any marked change in the gross appearance of the extracted tooth. The dentist and the patient should not for a moment suppose that the tooth was harmless or even a desirable possession because it looks practically normal after removal. We can tell from the radiogram before extraction whether the root has been denuded or eroded and if so to what extent. And changes in the tooth itself are not the decisive factor in deciding that a focus of infection exists which, if not capable of cure by treatment through the root-canal, requires extraction.

The fang of a rattlesnake or the needle of a hypodermic syringe may be perfectly smooth and still convey an active poison. The putrescent pulp of a tooth may poison the system through the apical foramen without any necessary change in the gross appearance of the root.

We sometimes hear that some dentist has told some person that a blind dental abscess will sometimes exist for years without causing illness. The inference is intended to be drawn that, if you have symptoms or lesions which all the dental, medical and surgical authorities state are often caused by dental infection, it is just as well not to have an x-ray examination, and when one is made and shows the existence of a blind abscess the inference these people suggest is, that it may just as well be left untreated and uncured.

I don't believe that at the present time any dentist would make the statement unqualifiedly or would draw these conclusions from it. But years ago this was the case and the following history shows the natural result of such relief.

Dr. S. was referred to the author for the treatment of neuritis of the shoulder and forearm by high frequency currents applied from vacuum electrodes. At the same time he was under treatment elsewhere for very high blood pressure by x-ray flashes, a method in which the author fails to see any special virtue as compared with continuous application. He also complained of severe headache. Systemic infection from dental foci without local symptoms had not then been discovered. The author had made thousands of dental radiograms of cases with local indications and it occurred to him to make radiograms of all the teeth to see if the headache was a reflex from an infected tooth. These showed extensive destruction of bone about the apices of several upper teeth, and that report and the radiograms were taken by the patient to two different dentists who examined the teeth by their usual methods and pronounced them all right. The doctor did not want to hurt my feelings by telling me their report, and the teeth remained untreated until two years later, when he was in a serious condition at Battle Creek. Then the affected teeth were extracted and there was some improvement, but the proper treatment had been applied too late to prevent death by apoplexy at the age of fifty-six.

Another fatal case occurred just at the transition period in our knowledge of dental infection. The patient, Mrs. T., complained of a lame lower first bicuspid tooth, and a radiogram showed an area of rarefaction diagnosed by the author as periapical infection. The dentist, however, thought the tooth was not infected but simply irritated by impact with the corresponding upper tooth. His treatment was not by opening the tooth and applications through the root canal, but by grinding the two opposing teeth. A year later a frank abscess developed with great pain and some swelling and recurrences during a long course of treatment. Later rheumatic symptoms ensued and septic endocarditis with infarctions in the spleen, kidneys, lungs, pluræ, and brain. This illness lasted seven months with pain, convulsions, paralysis and complications affecting the eye, ear and nearly every other organ. All the twenty-five general and special physicians and dentists who saw her as occasion arose attributed the illness and death to dental infection.

The natural way now is for an x-ray examination to be made upon the occurrence of the first local or constitutional symptoms and for radical treatment to be applied to any dental infection revealed.

I do not believe that a person is often well into the abscess cavity. Guided by the radiogram the dentist presses his drill into the right for years with a blind abscess of a tooth. I have known many persons who were up and about with a variety of painful if not disabling symptoms, who all this time had a dental focus of infection and who got well after the latter had been discovered and treated. To my mind, this indicates not the harmlessness of such a focus, but that very often the system is able to resist the infection long enough for the symptoms to be recognized and proper methods of diagnosis and treatment to be applied.

When a dentist or a physician says that the dental infection idea is often overdone, I have sometimes found on inquiry that he refers to a case in which he knows all the teeth of say a thirty-six year old woman to have been extracted. He naturally thinks that many of these were probably not infected and might better have been preserved. And that is exactly the reason for an x-ray examination. The strongest reason to suspect dental infection does not afford an indication for extracting all the teeth but for locating the infected ones and acquitting the harmless and useful teeth. Another dentist may refer to the fact that the radiographer has told the patient that, if the abscesses revealed had been left undiscovered and untreated, some of the serious symptoms or lesions described above would probably have ensued. The dentist thinks his patient has been unduly alarmed. And it really would have been part of wisdom as long as the examination has been made and the trouble and its remedy discovered to omit the list of the dangers that have been averted.

A patient who is a great-grandmother but is very active bodily, and mentally, has practically all her natural teeth but has a discharging abscess of an upper bicuspid. Her dentist referred her to me for an x-ray examination of all her teeth, and many chronic infections were shown with the bone so extensively involved that several teeth could not apparently be restored to a healthy

condition. Only the lower front teeth could be given a clean bill of health. On asking the patient herself whether this had affected her general health she said "not at all." And still she had two strokes of paralysis, has paralysis of the trigeminal nerve, has a bad knee, for which the author applied high frequency current by vacuum electrode several years ago, and has some asthmatic trouble. Such a case and the numerous cases of arthritis or of myositis enduring tortures or disability for years from untreated dental infection show how slow it is to produce death by its own poison. The more terrible cases alluded to were rapidly fatal from secondary lesions which are always to be feared. But just as the rattle-snake always gives warning, these fatal complications of dental infections are practically always preceded by signs which he who runs may read. But unlike the rattle-snake its warning is not empty noise but some real injury though the latter is fortunately temporary as a rule, if the warning is heeded.

These prolonged cases could not be said to be well for years in spite of dental infection; the truth in these cases is manifestly that they have been ill for years. And it is the author's belief that, if the dentist knew all about the patient, very few cases with dental infection would be considered well for years.

An illustrative case is that of a lady about sixty years old who came a couple of years ago for dental radiography because of constitutional symptoms. A space was seen at the apex of a dead and treated tooth occupied by pus or by a granuloma. The dentist is especially skillful and experienced in the subject of dental infection and his judgment was to let the tooth alone "as long as it did not make the patient sick." This advice was taken and for two years the patient was able to be about and to enjoy life, which was the basis for the supposition that the tooth was not causing illness. All this time however, the indigestion continued and there was a gradual increase in the high blood pressure and the sense of fullness in the brain and the pain in the knee (with negative radiographic appearance) and especially a gouty swelling and redness and pain in the nose. An extended series of inoculations with extract of every conceivable article of food and drink showed no reaction to indicate that any of these caused the symptoms. Then a radiograph showed the affected tooth to be in the same condition as two years previously. It could not be cured by treatment and the dentist extracted it. A sac was adherent to the root. The symptoms including the high blood pressure were all improved immediately, and the final result was that the blood pressure became normal and remained so, and the other symptoms all disappeared.

The burden of proof should not be thrown upon the patient to prove that he is actually sick and more especially to prove that his sickness is due to the infected tooth. Such a course gives the infected tooth too great an opportunity to do irrevocable harm.

The burden of proof that the tooth is actually infected should not be thrown upon the patient, who is manifestly ill and who has a manifest periapical cavity, which might look very much the same whether it contained pus or an infected or uninfected granuloma, or who has a dead tooth from which the nerve has not been removed in whole or part, or the root of which has been only partially filled, leaving a space prone to infection.

Whenever it is a question between saving the tooth and saving the patient, the latter must have the benefit of any doubt.

In many cases both the patient and the tooth can be saved by the treatment of the latter. But if conditions are such that the tooth cannot be treated and it manifestly may be a focus of infection, and the patient has symptoms well known to be often due to dental infection, the patient and not the tooth should have the benefit of any doubt.

In a case of disease, say rheumatism, an x-ray examination of the teeth is made not chiefly to find out the cause of the disease and a possible or probable cure, but far more to find out whether there is tooth infection, which may well be a much more important matter than the symptom or lesion which has suggested its possible presence. Supposing there is an infected tooth in a case of arthritis, how are we going to prove that it is the cause? Supposing there are tubercle bacilli in a patient's sputum or diphtheria bacilli in a culture from a patient's throat, how are we going to prove that the germs are the cause of the

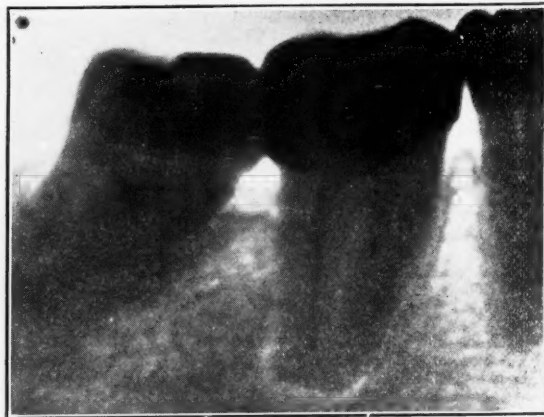


Fig. 9.—Dental infection in a case of herpes zoster, tonsillar and general infection (referred by Dr. E. C. Titus).

patient's illness? Observations and experiments by the world's greatest scientists with every hospital and laboratory facility and extending over years, were required to prove that these are the cause of these two diseases. To prove it an individual case might well be impossible, and even the attempt would certainly subject the patient to experiments and delays and dangers. The usual custom is to proceed with measures of treatment and prevention of contagion just as if Koch or Klebs Loeffler had made the actual demonstration of the causative relation in our particular patient.

There are cases where secondary lesion is of so serious or permanent a character that no radical improvement seems to be expected from the discovery and cure of the primary cause. Even here an infected tooth is not a benefit to the patient and is a very probable cause of still more painful and serious lesions and of nonsuccess of remedial measures.

Dental infection sometimes shows how severe it has been by the reaction which ensues when the tooth is extracted or the abscess opened into through the

root-canal. This is a reason for not initiating treatment of more than one focus at once.

When the dental infection is the cause of the symptoms or lesions an immediate cure is not always to be expected. A condition of the system which has lasted for years may not instantly respond to the removal of the cause, though the ultimate result may be perfect. In fact, if there is instant benefit the patient had better be warned that this may be temporary and that lasting benefit may come gradually.

Pyorrhea: This is practically always known to the patient and dentist. In England it is considered to be the most common cause of arthritis. It requires

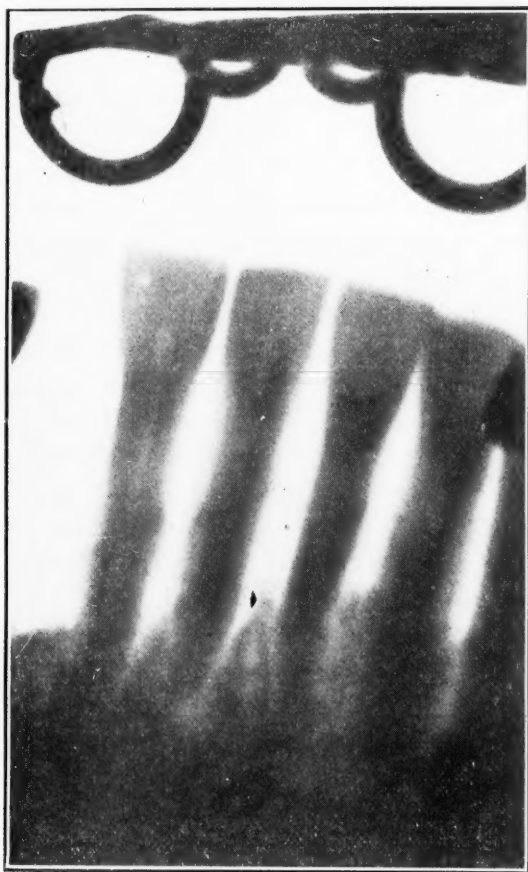


Fig. 10.—Pyorrhea in a case of sciatica.

no x-ray examination to detect its presence. It is only necessary to realize that it can cause the same troubles as a blind abscess and that the primary infection is controllable by treatment in most cases and immediately cured by extraction in most advanced cases.

Even without any belief in the causative relation and regarding it merely as a coincidence that dental abscesses and other dental infections are frequently found on x-ray examination in cases of arthritis and a good many other diseases, no one but a Christian Scientist would for a moment doubt the desirability of discovering and curing the dental infection.

Coming now to Christian Scientists, the author has explained to them whether from an error or from a physical cause over which the mind has no control, teeth actually do develop carious cavities which only the dentist's tool can clean out and which only filling with a suitable physical substance can protect from further decay and infection. When germs have passed through the exposed canaliculi or pores of the tooth-substance, like water through a filter, they often cause putrefaction of the dead nerve just as germs cause putrefaction of dead animal or vegetable substances entirely outside the human body. In the latter case we know that toxins or poisonous substances are produced which will injure or kill animals absorbing them, and when we see 23 persons out of a cooking class of 27 die after eating from the same supply of canned string-beans containing, as subsequent analysis disclosed, the bacillus botulinus, we cannot avoid the conclusion that it was a grave error for them to eat the infected vegetable matter. Whatever the best treatment for the resulting poison, common prudence would prompt the scientist no less than the nonbeliever to sterilize the home-made canned string-beans by the physical agency of boiling before eating them and so avoid the poisoning. A putrescent tooth-pulp has been shown by animal experiment to contain germs and toxins which will cause in animals the various lesions and symptoms which occur in human beings with dental infection. The putrescent tooth pulp is in a cavity with hard walls, which can neither collapse, and so obliterate or produce granulation, nor cure itself by any other natural process whether under influence by the mind or not. Like dislocation of the shoulder, it is a physical condition which with our present knowledge cannot be cured without the use of physical agents. Whatever may be the treatment of a burn, common prudence would suggest to the scientist no less than to the unbeliever, the un wisdom of cleaning gloves with gasoline near an open fire. Common prudence would indicate the un wisdom of allowing to remain undiscovered and unremoved a physical cause for trouble. No matter what one's belief might be, he would not leave on the surface of the body a quantity of acid or caustic alkali accidentally spattered there, but would promptly wash it off. He would remove the physical cause of trouble as soon as possible, regardless of his belief and regardless of the treatment to be adopted for the resulting burn.

I understand there is a statement of Christian Science to the effect that mind is the only thing and that physical objects and forces exist only in our minds. Suppose that to be true, it is also true that we cannot live without imagining that we eat imaginary food, potatoes for instance. And we know very well that without imaginary Paris green imaginary potato bugs would have devoured the green plants and there would have been no potatoes. We think we see the potato bugs and the holes they eat in the leaves and we think we see the cavity in a tooth, or a pyorrheal pocket around the neck of a tooth or by means of the x-ray, a blind abscess about the apex of the root of the tooth. And just as much in one case as in the other, if we want healthy potatoes or a healthy mouth, we must think that we apply imaginary physical substances and physical forces to combat the imaginary harmful ones. Personally I think we must be mistaken about what the Christian Scientists believe. I think they know

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as well as we do that potatoes and potato bugs and teeth and dental infection actually exist. But they feel that, if some part of the human body were comparable to the green plant and were being destroyed or damaged by something comparable to the potato bugs, this could be combated by a mental effort without resort to physical agents. The author knows a great deal about the influence of the mind over the body and a great deal more about the physical condition present in, say, a blind abscess of a tooth. He is firmly convinced that this is no more subject to a mental effort than are the potato bugs on the living plant.

The author is not a Christian Scientist but does believe in helping every sufferer and that this is one of the cases where the aid of physical agents is required. The fact of our present dependence in some cases upon physical agents is illustrated by the case of air, water and food without which life itself ceases.

ABSTRACT OF CURRENT LITERATURE

Covering Such Subjects as

ORTHODONTIA — ORAL SURGERY — SURGICAL ORTHODONTIA — DENTAL RADIOGRAPHY

It is the purpose of this JOURNAL to review so far as possible the most important literature as it appears in English and Foreign periodicals and to present it in abstract form. Authors are requested to send abstracts or reprints of their papers to the publishers.

Cancer of the Tongue a Preventable Disease. J. G. Bloodgood (Baltimore).
The Dental Digest, September, 1921, xxvii, 9.

The distinguished surgeon states that as a result of a study of 260 cases of cancer of the tongue, the evidence is convincing that the great causal factors are smoking, including actual burns due to this habit, and persistent irritation, especially by dirty, rough teeth and imperfectly fitting plates. In carefully taken case histories the presence of a precancerous lesion is as good as universal. In other words a campaign of education should in theory do away largely with this affection. Even in the earliest stages, about a third of surgically treated cases are doomed, and in advanced cancer this percentage is cut down to 12. By cure the author means a five year intact survival. He believes that he has saved 105 men from this disease as a result of educational prophylaxis; and the sphere of influence of the dental profession in this domain must be great. No man should continue the use of tobacco after the appearance of leukoplakia and no man should neglect to have his teeth put in order at the same period. Syphilis in the author's experience is a greatly overrated causal factor and in any case a syphilitic has sufficient outside motive for getting cured. He knows of but one way to handle leukoplakia—by radical excision without a preliminary biopsy which may stimulate the growth of the possibly cancerous tissue already present. In this excision we may find out later that we have actually extirpated a cancer.

Certain Non-Technical Considerations in the Treatment of Hare-Lip and Cleft Palate. H. E. Coe (Seattle). Archives of Pediatrics, October, 1921, xxxviii, 10.

The author refers to the ideal surgeon as "a medical man who performs surgical operations." He is therefore in position to fix the optimum moment for an operation and to prepare the patient for the intervention. The double criterion in operating for these malformations is the optimum moment in development and the optimum of general condition. When the time is ripe the pediatricist calls upon the surgeon, who, in the absence of the former, would be very apt to operate when first summoned on the theory that operation being

inevitable had best be done as soon as possible. In regard to general condition the child should be putting on weight at a normal rate, and should have a good blood count and be free from local infection. But while hare-lip may be operated on as soon as the fifth or sixth month cleft palate must be left to the twelfth or eighteenth. The author lays down no rule when the two malformations co-exist in the same patient, but we find the statement that when the lip is operated on, cleft palate if present should also be treated at the same time. Since it is urged that the palate should not be closed until the period above mentioned and that in some children there should be considerable preparatory treatment which may comprise tonsillectomy, etc., and further, that time may be required to bring up the hemoglobin to 80 and the weight to the normal figure, it would seem to follow that the hare-lip operation be left until the palate is ready for closure.

The Prophylactic Value of Nitrous Oxide-Oxygen in the Removal of Diseased Teeth. B. H. Harms (Omaha). *Current Research in Anesthesia and Analgesia*, November 15, 1921, Bulletin No. 16.

The author sums up in advance that when he uses a local anesthetic for the extraction of infected teeth the patient is apt to develop a more or less violent reaction or an exacerbation of the infection. If on the other hand the nitrous oxide-oxygen association is used this sequel is practically never encountered. Thus it may happen that an autoinoculation which follows extraction under local anesthesia may doom a robust man to hospital confinement while the opposite condition may be seen when a safe extraction of numerous infected teeth from a bedridden patient may enable the latter to leave his bed. Local anesthesia involves meddling with the existing conditions. The circulation is interfered with and this lowers the powers of resistance to infection. Even in nerve blocking this occurs save when the tissues blocked are the gasserian and sphenopalatine ganglia. It is quite likely, however, that local anesthesia for the extraction of one or two incisors might entail no risk if the operation were limited to blocking the inferior dental nerve. A bloodless operative field is attractive to the operator but the patient's ultimate welfare comes first.

Oral Sepsis as a Source of Systemic Disease. J. H. Rishmiller (Minneapolis). *The Journal-Lancet*, Oct. 20, 1921, xli, 20.

The author is prominent as a railway surgeon and some of his cases are in railway employees. The subject of oral sepsis includes septic mouth in the local sense, and metastatic infection from the same. Naturally there may be metastases from mouths which may not present clinical sepsis. In certain cases severe injury may be the starting point of metastases. Thus in the case of a brakeman in a railway smashup the patient did not recover as he should have after his sprains and bruises had disappeared. He had numerous areas of pain and soreness in the trunk and limbs. In the course of a routine examination it was noted that of the twenty teeth which he retained ten were

loose. An x-ray examination led to the advice that every tooth in his head along with four stumps should be extracted. He at once improved following the extraction and in three weeks was free from all symptoms. This case illustrates the relation between septic mouth on the one hand and pseudorheumatic and pseudoneuralgic affections. The joints, muscles, ligaments, bursæ, etc., may not show symptoms until there has been a diffuse traumatism. However, the latter is by no means necessary or the rule. In a second case cited the patient did not recover from an attack of so-called grippe. His symptoms suggested exophthalmic goitre or cardiac disease with evidences of mental disorder. A neurologic examination did not clear up the case save that organic disease might be excluded. As the tonsils and teeth showed evidences of suppurative foci these structures were removed, whereupon the mental apathy and drowsiness at once improved and he was accepted for military duty. In a third case rheumatism was so closely simulated that a purpuric rash developed, but extraction of infected teeth corrected the condition without resort to salicylates or other drugs.

Pyorrhea Alveolaris. H. Clay Watson (Waco). *Texas Dental Journal*, September, 1921, xxxix, 9.

This paper was read by request. He had taken a course under Dr. Hartzell at Dallas and holds to the latter's teachings, save in a few cases in which he removes pockets surgically. He believes it ethical to give the patient that type of treatment which we would give ourselves and hence while there may be good ground for extraction, one may personally lean to conservation for self and family. For the same reason he would prefer a less skilled and experienced dentist to a master, if the former were conservative and the latter radical. To leave a tooth behind is not like leaving a tonsil behind and seldom does harm.

Under causation of pyorrhea he accuses acid-forming bacteria which collect and multiply between the teeth, doubling every 22 to 35 minutes. The acid excreted forms the lime deposit on the teeth. Naturally these germs subsist best between badly occluded teeth or teeth which are neglected. In diagnosis the x-ray is not only indispensable at the start but shows the progress of the case under treatment—for example it may show mouths in fair condition when the teeth have hardly any bony attachments left. The general rule, of course, is to extract when $\frac{1}{2}$ to $\frac{3}{4}$ of the attachment has been forfeited. In prognosis everything depends on the patient's willingness to cooperate, in the tedious daily cleansing of the teeth. A vital stain should be used to show the patient the diseased area. Not until the patient has learned the daily care of the teeth should the latter be sealed by the dentist. If the pockets are not surgically removed they must be medicated with the iodine-creosote application.

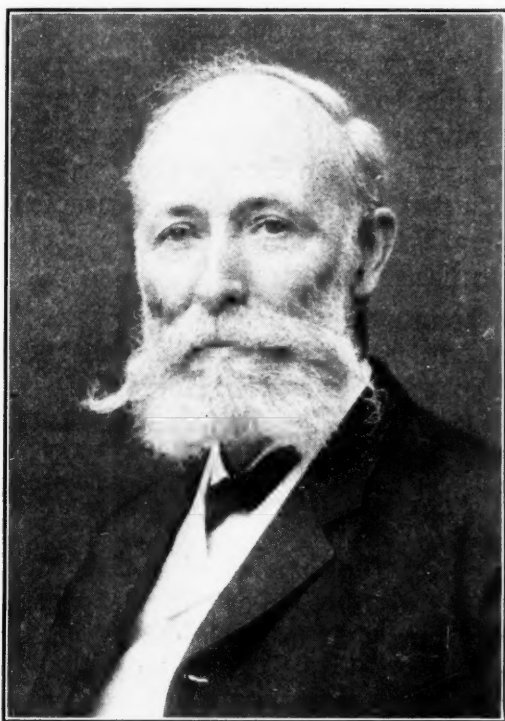
IN MEMORIAM

DR. EDWARD AUGUSTUS BOGUE

EDWARD AUGUSTUS BOGUE, born in Vernon, Oneida County, N. Y., 1838; died in New York City, 1921; the descendant from a long line of Scotch Presbyterian clergyman.

His father was Rev. Dr. Horace Publius Bogue and his mother Grace Caroline Brown.

Doctor Bogue's earliest education was obtained in his father's study and at Seneca Falls Academy under Prof. Orin Root, Sr. Ill health prevented a college course in letters and his professional training was begun at a very



Dr. Edward Augustus Bogue.

early age in the New York College of Dental Surgery at Syracuse under Prof. Amos Westcott, with whom he remained as a private pupil after having taken three courses in the college.

His first position after leaving Dr. Westcott was with Bartlett and Miles in Ithaca, N. Y., which was interrupted by another serious illness, after which he left Ithaca. Upon recovering from that illness he went to Chicago into the employ of Dr. William H. Kennieutt with whom his elder brother had been

associated in the practice of dentistry until his death. He was shortly received into partnership with Dr. Kennicutt, with whom he remained several years, later opening an office for himself and continued in practice independently until some time after the death of Dr. Kennicutt. During these eight years of practice in Chicago he was frequently called to the assistance of Dr. Freer, professor of surgery at Rush Medical College, and Prof. H. A. Johnson, with whom he afterwards became a special student in medicine, attending his first course at Rush College, and subsequently attending a final course at Castleton, Vt., under the special instruction of Prof. C. L. Ford, the anatomist. Shortly after graduating in medicine he began the study of French and German, which led to his becoming the teacher of a French Bible Class, composed mostly of members from the congregation of the French Catholic Priest—Father Chiniquy—who had become Protestants and removed from Montreal to Kankakee and St. Anne, Ill., leaving a little remnant, by the way, in Chicago. This Bible Class later on became a French Protestant Church, attached to the Old School Presbyterian body.

On the breaking out of the Civil War, Dr. H. A. Johnson of the Examining Board of Surgeons urged upon Dr. Bogue the acceptance of an appointment as surgeon in an Illinois Regiment, but upon examining him physically the Examining Surgeon ordered him to go to Europe to seek a restoration to health, which he said would only come with freedom from work for a time. Several acres of land, now lying within the City of Chicago, were sacrificed to procure the means for his first trip abroad, which occupied about ten months. A considerable portion of this time was spent in the mountains of Switzerland to his improvement in health and strength.

During this trip the treatment of cleft palate became of interest to him, and on his return to America he landed at Boston and became acquainted with Dr. Thomas B. Hitchcock, Dean of the Harvard University Dental School, who also had been giving some attention to the treatment of cleft palate. From Boston he went to New York, meeting Dr. N. W. Kingsley, and spending with him sufficient time to become fairly acquainted with his method of treating this malady.

On his return to Chicago he contributed to the Chicago Medical Journal of which Dr. N. S. Davis was editor, an article on the mechanical treatment of cleft palate, which was published in 1863, and which led to a further correspondence with Dr. Kingsley. This resulted in Dr. Bogue's removal to New York in October, 1864, to become associated with Dr. Kingsley, and to care for his practice during Dr. Kingsley's absence in Europe. A successful practice was very rapidly built up so that New York became from that time forward, his home.

About 1870 Dr. Bogue was called to a lectureship in the Harvard University Dental School, in which capacity he served five years, until after the death of Dr. Hitchcock.

About 1875 Dr. Hitchcock and Dr. Bogue agreed upon a plan for opening an office in Europe, where it was hoped the expenses of a vacation trip for each of the partners concerned might be earned while the families of each

might enjoy a temporary home with the advantages of European life and study during what otherwise would be the vacation time. Drs. Moffit of Boston, Cook of Brooklyn, and Daboll of Buffalo, were included in the scheme, but before its consummation Dr. Hitchcock died. The office was nevertheless opened in the autumn of 1877 under the firm name of Bogue, Moffit, Cook and Daboll at 39 Boulevard Haussmann, Paris, with Dr. Junius E. Cravens of Indianapolis as first assistant and incumbent. Two or three years later Dr. Isaac B. Davenport became associated with the firm and remained associated with Dr. Bogue after the final dissolution of the firm at the end of the partnership agreement, and for several years thereafter. This office continued in existence twenty-three years, at the end of which time Dr. Bogue relinquished his practice in Paris to Dr. George A. Roussell to confine himself exclusively to New York.

During all these years from 1863, Dr. Bogue has contributed, what he calls ephemeral articles, on dental subjects, which are scattered through various magazines, principally the *Cosmos*, *International*, *The Digest* and the *International Journal of Orthodontia and Oral Surgery*. Some of these articles have been translated and published in other countries and one or two of them have been utilized for purposes of instruction in several of the dental colleges.

His inventions in the line of his professional work are numerous, but he never took out a patent, believing that as a member of a liberal profession he owed as great liberality to others as had been shown to him by his instructors.

He was one of the charter members of the American Dental Association when it was organized at Niagara Falls. He was made Secretary of that Association shortly afterward, and at the time Dr. Taft was made president he was chairman of the Committee on By-laws, which arranged for the election of officers at the end of the Sessions rather than at the beginning, it having been found in those early days of dentistry that the main interest in meetings centered in elections, and after elections were over the numbers in attendance rapidly diminished.

Dr. Bogue was probably one of the first foreigners to be elected to full membership in the Odontological Society of Great Britain, and for the last few years has been one of the nonresident councilors. He was also made a member of the Odontological Society of France, and of the American Dental Club of Paris, of which he has been president. He has also been president of the New York Odontological Society; of the First District Dental Society of New York, and of the New York Institute of Stomatology. He was also a member of the New York State Dental Society, the American Academy of Dental Science of Boston, the International Dental Federation and was a member of the New York Institute of Dental Technique, before the society was merged with the First District Society of New York. Dr. Bogue was made a life member of the First District Dental Society shortly before his death. The last paper that he read was given before the American Society of Orthodontists, of which he was a member, in April, 1921. He was an honorary member of the Alumni Society of the Dewey School of Orthodontia, which honor has been conferred upon but one other, namely, Doctor Victor Hugo Jackson, of

New York City. He was for nearly twenty years one of the Examining Board of the First Judicial District of the State of New York, until the district boards were abolished in favor of the State Board at Albany.

In 1865, Dr. Edward Delafield, then president of the College of Physicians and Surgeons, suggested the formation of a Dental Department in connection with the College, asking Dr. Bogue whether he would accept a professorship should such a department be established. He declined to do so, first on the ground that he was not sufficiently qualified, and secondly, that being a comparative stranger, the general support and sympathy of the dental profession might not be secured, suggesting that the naming of such a professor should be left to the First District Society, the College retaining the veto power. This led to an effort to incorporate the then existing but not very flourishing New York College of Dentistry with the College of Physicians and Surgeons, with results that were so far from satisfactory that not only was there no union, but certain friends of the proposed measure withdrew their favor.

During the last twenty years of Doctor's Bogue's professional life, he was widely known for the interest that he took in the study of malocclusion. It interested him more than any other line of professional work. A great amount of his time was given to the study of the development of dental arches in children, and his last few papers, as published in the *Dental Digest* and the *International Journal of Orthodontia and Oral Surgery* dealt exclusively with the benefits that could be derived from the early treatment of malocclusions. He even went further in his theory, contending that most malocclusions could be prevented if the deciduous arches were given the proper treatment before the eruption of the permanent teeth. He contended that the deciduous arches should have a certain width at the age of five years, and if that width did not exist we could safely conclude that the child was not developing normally. The reasons for this deduction were based on the examination of a large number of children with normal dentitions and who showed a normal development, as compared to others who were abnormal. In his late years, he claimed that if the dental arches of children were underdeveloped it meant there was lack of growth in other parts. He stated there were three ways of producing the proper development of the dental arches; mechanical interferences with orthodontic appliances which would supply the stimulation that had been lacking; the proper food and exercise, and the employment of internal medication especially the extracts of the ductless glands.

At the time of his death, he was doing considerable work to show the benefits that could be derived by the use of extracts of the ductless glands. Several patients were under treatment, which we had the privilege of observing that were showing marked improvement.

Doctor Bogue's interest in orthodontia enabled him to collect a large number of casts that were made of patients at various ages. His collection of casts extending over a period of over forty years, show the position of the teeth a long time after the malocclusion was treated. He also has casts of individuals in whom the malocclusion was never treated, taken fifteen and twenty years apart.

We know of no collection of casts in which there is such a variety of cases shown or in which they have been gathered from the same patient extending over so long a period of time.

During Doctor Bogue's long professional life he was very careful to make records of all of his work and those records were very carefully preserved. A great many were made in his own handwriting, and it was our privilege to examine some of them a short time before his death.

Doctor Bogue has always suffered more or less from ill health. A misfortune which overtook him during the late years of his professional activities, would have discouraged many men, but he continued to work and to preach his doctrine of preventive orthodontia.

It is very fitting that the last paper which he presented was given before the American Society of Orthodontists. It was very well received by the majority of men present, showing that while some men may not accept his work as final, still his ideas are being accepted as part of modern orthodontic teaching which will probably become more valuable in the passing years.

RESOLUTIONS RELATIVE TO THE DEATH OF
DR. MATTHEW HENRY CRYER

WHEREAS in the death of Dr. Matthew Henry Cryer the Academy of Stomatology in common with the whole dental profession has suffered an irreparable loss we, his colleagues of the Academy, desire to thus record our recognition of his services to dental science and our appreciation of his high character as our friend and professional associate.

Dr. Cryer was one of the founders of the Academy of Stomatology and was always actively interested in its progress and welfare. Many of his contributions, the results of his original research, were first brought to the attention of the dental world through the medium of the Academy meetings. As a participant in the discussions of papers his remarks were always those of the constructive critic, the seeker after truth and devoid of the dogmatism of the special pleader. He was thus always a stabilizing influence in directing the debate through the mazes of error and personal feeling toward the calm, clear waters of scientific truth.

As an original researcher in the domain of anatomy both human and comparative, his publications record the extent and character of his life-work in a field where his name stands preeminent among distinguished co-workers whose reputations are world wide and forever enduring.

As an oral surgeon his attainment places his name beside that of Garretson as the creator and principal exponent of that now well established and important specialty.

In his professional relationship he was the ideal colleague, the helpful and loyal friend.

We, his fellow members who throughout the life history of the Academy

of Stomatology, have enjoyed the privilege of intimate professional and friendly relationship with him, mourn in the common loss which dental and medical science has sustained in the death of Dr. Cryer. Therefore, be it

RESOLVED that this expression of our appreciation of his worth and our sorrow at his loss be recorded upon the minutes of the Academy of Stomatology and that a copy thereof be sent to his family and to the dental journals for publication.

EDWIN T. DARBY,
DANIEL NEALL McQUILLEN,
EDWARD C. KIRK, CHAIRMAN.

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EDITORIALS

Are Entrance Requirements to Medical and Dental Schools Becoming Too High?

WE HAVE always been in sympathy with higher education, and believe medical and dental students should have sufficient preliminary education before they begin the study of the profession.

During the last few years, we have noticed a tendency in both the medical and dental schools to raise the preliminary educational requirements so high as to be in danger of passing a practical point and making preliminary education an obstacle, and probably produce more harm in the professions than would result if entrance requirements were not raised so much.

Recently in conversation the dean of a medical department of one of the large universities expressed regret that he had to turn down so many young men, who would otherwise be a credit to the medical profession, because they were short some of the credits required in the medical schools at the present

time. It is a well-known fact that medicine has had much higher requirements for a number of years, than dentistry, and we are able to observe some of the results which are occurring because of that fact. In the first place, the number of physicians has been reduced to the minimum and it is questionable whether enough medical men are being graduated to give the proper attention to the public, even in normal conditions. In the case of epidemics, which was shown a few years ago by the epidemic of influenza, the medical profession is greatly overtaxed to provide the proper medical service.

As a result of this, we also see certain things beginning to develop that are probably going to produce more harm than would occur, even if physicians who were not so well trained as the present standards hold, were allowed to practice medicine.

I refer to the rapid development of neuropractic, chiropractic, and osteopathic schools, as well as many cults which are springing up in the various cities. We find the students who do not possess the proper preliminary education that medical schools require, are taking up these various practices and cults, and we also regret to state that in a number of instances, state laws are being changed so as to give chiropractic, osteopathic and neuropractic and other so-called "schools" practically the same standing as the medical schools. With these schools being recognized by state boards, the public will probably suffer more from improperly trained men, coming from these schools than they did years ago when medical schools were more numerous and the standards not so high as they are at the present time.

In other words, we believe that a man who is a high school graduate and spends four years in a reputable medical school will do far less harm than these graduates of chiropractic, osteopathic and neuropractic schools that now exist all over the country. Therefore, these pseudoscientific schools have been able to exist and in fact have come into existence because of the fact that medical requirements and medical education has been placed on such a high standard, that it is becoming impractical and impossible for but a few individuals to study medicine at the present time. While we are in favor of higher education and higher medical standards, we must not forget that the point may be reached where more harm may be done the profession and public by these high standards, than if the standards were lower and more practical.

Since medical schools have raised their standards to such a high degree, we find a certain group of men in the dental profession who are clamoring that dental education have the same high educational requirements. We admit this is very idealistic, but we contend it is very impractical, and is bound to do much harm to the dental profession and the public. In fact, dental education, when it required a man to have four years of high school and take four years of training in a dental school, had reached about as high an educational point as it could and still remain practical. If any individual student wishes more education, either before he enters dental school or after completing the dental course, it is perfectly feasible for him to follow that plan of study, and then it remains to be seen whether he is better equipped to serve the public

than the student who only has four years of high school and four years of dentistry.

We have always had in dentistry a number of men who possessed medical and dental degrees and who were college graduates before studying dentistry, and in some instances these men have rendered superior service to their profession and the public, while in other cases the service which they rendered has not been superior to that given by individuals who did not have so much education.

This year a number of schools required one year of college instruction before a student could enter dental college, and that as a requirement has been a great hardship on many students and has been more or less impractical in some schools that have adopted it. In fact the State of New York was confronted with rather an unusual proposition owing to the fact that students in New York City who desired to study dentistry had considerable difficulty in obtaining the one year of college work before entering dental school. We do not know what the final arrangements are that have been made with the Universities, but we do know that several students who applied for one year in college work in order that they might study dentistry, were informed by university authorities that no provision could be made for one year students, because the universities and colleges were filled to capacity with freshmen students who intended to complete four years of college work. In other words, none of the universities were anxious to accept students for only one year of college work because it made their freshman class very large and then would result in a small sophomore class owing to the fact that a number of students would drop out to study dentistry. Even in some of the universities that have dental departments, we have been informed by collegiate authorities, that they object to taking one year students and training them for dentistry because of the reasons mentioned.

Therefore, the one year of college instruction became rather an unwieldy thing from the practical educational standpoint, regardless of whether the extra year is time well spent. So far as professional training was concerned, we have always contended that this extra college year was practically a year wasted because it was taken up in the study of subjects which had very little practical bearing upon dentistry. Such subjects as are of value that are given in one year of college work can be included in the four year dental course by a careful arrangement of time and study during the student's career.

Not being content with four years of high school and one year of college work as preliminary to the study of dentistry, some schools are now advocating two years of college work before the beginning of the four year dental course. We fail to see how two years of college work is going to be any benefit to the student in the study of dentistry. We still fail to see how that is going to aid him in the study of pathologic conditions or in saving pulpless teeth. However, not being satisfied with two years of college work, a few schools are advocating that a student should have an A.B. degree, and others, a medical degree, before they study dentistry. These latter propositions seem to be very imprac-

tical. We have said before that we have no objection to a student's having an A.B. degree before he studies dentistry, or to his getting a medical degree, either before or after his dental degree, but to make every student fulfill those requirements would be making an autocratic requirement that would exceed all practical results.

We recently heard the dean of one dental school state that they were planning in 1926 to make all dental students possess an A.B. degree. The question naturally arose in our minds: Why should this school stop with an A.B. degree and not require all students to have a degree of Doctor of Philosophy, before studying dentistry? One degree seems to be about as practical as the other.

It is a pleasure to note that some university authorities are beginning to see the impracticability of the high requirements held for dental students by the dental departments in universities. We notice in a published interview Chancellor Hall of the Washington University in speaking about these proposed high standards for education says: "It might prove impracticable, until the public comes to a more thorough realization of the importance of dentistry as a profession. Should this very protracted and rigid course be adopted by university dental schools, the probabilities are that the attendance at such schools would materially decrease for a period of years; in fact, it is not yet demonstrated that university schools can continue under such heavy expenditure as this plan would require with such meagre returns as are likely. In other words, the financial problem may become so serious as to make the adoption of the proposed plan impracticable, at least for most schools."

Chancellor Hall was speaking from the University viewpoint, more than from the point of the profession or the public. He considered the plan might become impractical so far as the schools were concerned, but failed to give recognition to the fact that it would become much more impractical from the standpoint of the profession and the general public. We have previously mentioned the fact that because of high medical requirements a large number of men are being kept from the study of medicine, and are taking up study in neuropractic, chiropractic and osteopathic "schools." Dentistry is fast approaching the same position so far as pseudoscientific dental "schools" are concerned. If dental educational requirements are raised any more, it will make the study of dentistry more impossible than it is at the present time. We will find a great many men taking up dentistry in a so-called "school of mechanical dentistry," several of which already exist, and which are crowded with students because the men do not have sufficient educational requirements to study dentistry, and consequently are taking up mechanical dentistry. We find these schools of mechanical dentistry sending out very misleading advertisements, trying to convey the impression to students that they are studying dentistry and learning a profession, when as a matter of fact they are studying only a part of dentistry.

We find, however, some men in the dental profession who are in favor of these "schools of mechanical dentistry" and believe that dentistry should be split up between men who have had a high professional training and those

who have had only a mechanical training. That plan of instruction and practice has existed in some of the European countries for a number of years, and in the countries where it has existed, dentistry has never obtained the high recognition that it has in America. If we could keep the "schools of mechanical dentistry" in their proper place and be able to regulate the practice of men who had graduated from them it would not be so bad, but just as sure as the "schools of mechanical dentistry" become numerous and we have a large number of men graduated from them, we will find that these men will succeed in getting the state laws so changed as to license mechanical dentists to practice upon patients. They will have the law changed to enable them to take impressions and make artificial restorations, and it would not be long before they would do actual surgical work in the mouth.

Some men may believe the passage of such laws to be impossible, but it would not be impossible because the arguments would be held out to the public that mechanical men would render more economical and superior service if allowed to practice by themselves, instead of being allowed to work under the supervision of a dental surgeon.

It therefore seems to us that in viewing this subject of higher dental education from a practical and economical standpoint, there is great danger of the plans, as advocated by some schools, doing more harm in the end than they will do good. We believe it is the time for the dental profession to take an inventory of this educational problem, and see whether they have not been too lax in allowing a few men to have too much to say regarding a matter that is of vital importance to the entire dental profession.

ORTHODONTIC NEWS AND NOTES

The editors desire to make this department a permanent feature of the Journal, but in order to do so must have the full support of the orthodontic profession throughout the country. We would deem it a great favor if our subscribers and readers would send in such announcements as might be of interest to the profession.

Meeting of the American Society of Orthodontists

The next meeting of the American Society of Orthodontists will be held in Chicago, Illinois, at the Edgewater Beach Hotel on April 24, 25 and 26, 1922. A very interesting and instructive program has been arranged by the Board of Censors, consisting of Clinics, Case Reports and Papers of unusual merit. Reservation should be made early in order to secure the best accommodations.—Ralph Waldron, Sec.-Treas.

New York Society of Orthodontists

The next regular meeting of the New York Society of Orthodontists will be held during the afternoon and evening of Wednesday, February 8th, 1922, at the Hotel Vanderbilt, Park Avenue and 34th Street, New York City.

A scientific program including clinics and case reports will begin promptly at four o'clock. Dinner will be served at about six-thirty o'clock and the scientific program continued at the conclusion of the dinner.

Members of the profession interested in the science of orthodontia are cordially invited to be present. William C. Fisher, Secy.-Treas., 501 Fifth Ave., New York City. J. Lowe Young, Pres., 18 West 74th Street, New York City.

Alumni Society of the Dewey School of Orthodontia

The next annual meeting of this society will be held on April 27-28th at the Edgewater Beach Hotel, Chicago. The usual high standard of the meetings of this society will be maintained. All interested in orthodontia are cordially invited to attend these meetings. George F. Burke, Secretary, 741-43 David Whitney Bldg., Detroit, Michigan.